Ask your Jobber or write for Free Copies of our latest cumulative Index and "How to File" Folders

TRADE NAME	MODEL	FOLDER NO.
Air King	A-400 (Ch. 470)	4713-1
Airline	74BR-2001B	4713-2
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Automatic	Tom Thumb Personal ATTP	4713-4
Automatic	F-790	4713-5
Clarion	11801	4713-6
Emerson	537 (Ch. No. 120043)	4713-7
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General Instrument	Record Changer 204	4713-34
Jewel	300	4713-11
Majestic	5A445, 5A445R	4713-12
Mantola	R664-PM, R664-PV, R664-W	4713-13
Minerva	Portapal 729	4713-14
Monitor	M-510 (Fact. No. 472)	4713-15
RCA Victor	65BR9 (Ch. RC-1045)	4713-16
RCA Victor	68R1, 68R2, 68R3, 68R4 (Ch. RC-608)	4713-17
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Sentinel	L-284I, L-284NA, L-284NI, L-284NR, L-284W	4713-19
Sentinel	286P, 286PR	4713-20
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Silvertone	7148 (Ch. 431.188), 7148A (Ch. 431.188-1)	4713-22
Sonora	RWFU-238	4713-24
Steelman	200	4713-25
Stromberg-Carlson	1135PFM, 1135PLM, 1135PLW (Series 10-11)	4713-26
Tele-Tone	138 (Ch. Series "N")	4713-27
Tele-Tone	145 (Ch. Series "R")	4713-28
Temple	G-513	4713-29
Trav-ler	5019	4713-30
Truetone	D2710 (Fact. No. 24D22-630BR)	4713-31
Truetone	D2718 (Fact. No. 227D14-638IU)	4713-32
Woolaroc	3-12A/3	4713-33
Zenith	Record Changer S11468	4713-35

The PHOTOFACT Servicer

AUGUST 15, 1947 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ VOL. 3, No. 23

ROBERT M. ELLIS, *Editor*

NOW—STANDARDIZED SCHEMATICS!—A PHOTOFACT "FIRST"

It's the biggest advance in service literature in twenty years! That's the enthusiastic comment of service engineers who have had a preview of the *new* Standardized Schematics used for the first time in this Set of PHOTOFACT Folders. We have named this new system of schematic designations the "PHOTOFACT STANDARD NOTATION." You will agree it is bound to have a tremendous beneficial effect on *your* work and on the entire industry as well.

From the very beginning of PHOTOFACT, we have wanted to re-draw every schematic diagram to a uniform standard, because we eat, sleep and live the serviceman's problems, we knew that such standardization would save you hundreds of hours of time and countless headaches. With the uniform presentation, you would never have to take time out to trace the wiring on the schematic of a new set in order to understand its construction. The new features would be apparent at a glance. You would never have to puzzle out the differences in schematic representations. You would never have to "bang your skull" against a queer-looking diagram—only to find that the novelty was in the drawing and not in the set!

NOW—in spite of costs we are determined to give you *uniform, standardized diagrams on all sets!* This has been done for *you* and you *alone*—although all others in the industry will benefit in the long run.

NOW—you can reap the benefits that PHOTOFACT brings you exclusively in the new STANDARD NOTATION Diagrams. Now you can save time—go from schematic to schematic and see the *same,* easy-to-understand symbols and designations—without having to change your way of thinking each time. Now you'll be able to recognize instantly the functions of all parts in the circuit of *every set,* without having to dope out what was intended.

Beginning with Set No. 23 and from now on, all schematics in PHOTOFACT Folders will be drawn uniformly with Howard Sams STANDARD NOTATIONS. Sure—our costs have gone way up—but *you* benefit, and that's why we're in business.

"These Standards Are Yours"

It is important that you know *how* we developed the new system of STANDARD NOTATIONS. We realized that if we were to re-draw diagrams to a standard, we would first have to decide: "Whose standard?" In our investigations of this important subject, we found that there were *standards* and *standards,* and that few manufacturers were in agreement as to the most desirable representation of symbols and notations. Probably the worst discrepancy was in the methods of representing vacuum tubes—on these, every draftsman seemed to have a different idea. We wanted to know what YOU wanted, and so we included a poll on the tube basings in PHOTOFACT Folder Set No. 18, in which we asked for your vote. Your response to this was overwhelming and your answer was decisive as to the type of tube presentation you want—and this is the type you will now have in PHOTOFACT Folders.

In the actual selection of diagram symbols, thousands of schematics were examined. Whenever any doubts were expressed by our committee as to what form of notation was the clearest, most understandable and legible, field research was made, and the opinions of practical service engineers were obtained.

Frankly, it is not our purpose to tell radio manufacturers or design engineers how to draw schematic diagrams. Our sole concern is with YOU, Mr. Practical Service Engineer. PHOTOFACT Standard Notation schematics have been drawn to provide YOU with the obvious benefits that mean so much to accurate, time-saving servicing. Accordingly, the standards are *yours,* and we know you will like them. The clarity and simplicity of the standardized PHOTOFACT schematics will help you to do your work with new sureness and confidence.

Score another first for the PHOTOFACT organization which you continually tell us in your letters has, in the fifteen months of its existence, contributed more for the advancement of the service profession than all other organizations since the inception of the industry.

After you have had an opportunity to study these new schematics, we would appreciate a postal card or a note telling us how you like them—because we are guided in what we do by what you tell us.

WHAT IS YOUR TITLE?

During his recent visit to our establishment, we had a very interesting discussion with Dave Krantz, President of the P.R.S.M.A., of Philadelphia. Our topic was "What should be the title of a man who makes his living by repairing radio receivers?"

Your editor voted for the term, "Radio Engineer," because to be successful in the endeavor calls for a knowledge that greatly exceeds the mechanical skill required by the repairman of the average consumer item. The term, "Repairman," is disparaging for this reason.

Mr. Krantz pointed out that it was illegal in some states to use "Engineer" unless one actually had a college degree of that title or a state-issued certificate of approval to practice that profession. Further, none of us knew of any college or university which granted a degree of "Radio Engineer."

Then Dave gave us his recommendation, and we think it is a "honey." He nominates "Electronic Technician." We like this title because it indicates that the holder is qualified with both technical

knowledge and mechanical skill; and that he can do many things other than just repairing a radio receiver. It indicates he can service any device using a vacuum tube.

Our aim should be the adoption of a term which will provide the best public prestige and personal self-esteem. We should avoid either pomposity that brings lack of confidence, or self-depreciation which causes others to under-value us. The problem is not one of theory or vanity—our earnings rise or fall by the level at which we establish ourselves. Write and let us have the benefit of your thinking.

★ ★

PHOTOFACT, THE SUPER SALESMAN

Without comment other than sincere thanks we reprint as received a letter from our patron, Mr. Paul L. Petrichko.

Paul L. Petrichko Frank J. Cosgrove A. Ruth Petrichko

BUD & FRANK'S RADIO SERVICE

Radios • Supplies
Repairs
Auto Radios Installed

167 UNION AVENUE
PATERSON, N. J.

Greeting Cards
and Toys
Home Appliances Repaired

July 10, 1947

Howard W. Sams & Company, Inc.
2924 E. Washington Street
Indianapolis 6, Indiana

Gentlemen:

Howard W. Sams PHOTOFACT Folders are a great help to the serviceman. They are not something to place on the shelf until the new sets start coming into the shop for repairs and a use for the diagrams is found.

Howard W. Sams Folders are in daily use in our store. We employ them as our "SILENT SALESMAN." When a customer comes into our store looking for a new radio and we do not have anything in stock to satisfy the man or woman, whichever the case may be, we bring out our Howard W. Sams Folders and say "Perhaps you can find one you like in here and we can have it for you later in the day or tomorrow." We then show them the pictures of some of the new models in the Folders and nine times out of ten the customer will run across one that he or she likes and we manage to get it for delivery the same day or the next.

Seeing that we already have the diagram and other information to repair the set on hand helps a great deal to make the sale. Of course sometimes we cannot get the full dealer's discount on some of the sets they pick, but we usually come to some terms with the dealer and we make a few dollars that we would not make otherwise; it's a sale that we would not have made if we could not have shown them a picture of the set they were going to get.

We suggest that other shops put Howard W. Sams Folders to work for them when their stock does not include what the customer is looking for and we are sure that many sales will result that otherwise would have been lost to a competitor.

Howard W. Sams is our best salesman and the salary we pay for this service is but a buck-fifty a week. Try to hire a super salesman for this amount.

Yours very truly,
BUD & FRANK'S RADIO SERVICE
Signed: Paul L. Petrichko

PLP:B

★ ★

JUST TO REMIND YOU . . .

There are four pieces of literature that are a *must* for every PHOTOFACT User.

CUMULATIVE INDEX

You need the Cumulative Index that was included in PHOTOFACT Folder Set No. 20. If you have misplaced your copy—or if it is damaged or torn—or if you have not as yet purchased Set No. 20—write today for a copy of the new Cumulative Index. It identifies over 1,800 models, and it's mailed free on request.

HOW TO FILE

Filing PHOTOFACT Folders can be a pleasure instead of a chore if you will use the system best adapted for your shop. There are five good ways to file PHOTOFACT Folders, including the new "30-second" method which has been an instant hit. Your copy of the brochure "Five Good Ways to File" tells you how. It will be mailed on request.

DIAL CORD STRINGING GUIDE

The world's biggest bargain in radio service information is this handy pocket sized Volume. It shows clearly how to restring the dials on practically all receivers issued from 1938 through 1947 inclusive. You know how you can waste hours if you string the dial the wrong way and then have to figure out the right way. Place your order today for your copies of this indispensable book—only 75c each net. You will want two—one for your service bench and one for your kit. The edition is limited.

HOWARD W. SAMS 1947 AUTOMATIC RECORD CHANGER MANUAL

There's nothing like this new 400 page big book to give you real "how-to-fix-it" information on more than 40 different post-war model record changers. Shows exclusive "exploded" views; photographs from all angles—complete adjustment information—keyed parts list, plus data on leading Wire, Tape and Disc Recorders. You can't afford to be without this book. Order your copy today—the price $4.95 from your distributor.

★ ★

FIELD EXPERIENCES

Here is your opportunity for passing practical service experiences to others for the benefit of all. For every service "Field Experience" published, we issue to the author a certificate that is good for one PHOTOFACT Folder Set. Since it is impossible to verify the accuracy of contributions, we cannot be responsible for either the diagnosis made of the receiver trouble, or the results which will be obtained by following the suggested repair routine. All contributions become the property of Howard W. Sams & Co., Inc.

★

WESTINGHOUSE H-110

Photofact Set No. 4—464-19

"Models H-110 Westinghouse and all similar seven-tube models may have complaints of working o.k. on push buttons but inoperative on dial position. Look for open ground connections of oscillator coil on broadcast band. This connection is located on mounting bracket of oscillator coil."

★

WESTINGHOUSE H-125, H-126

Photofact Set No. 3—463-19

"On Westinghouse Radio Models H-125, H-126, a hum which can be traced to a definite filter hum may be eliminated by recrimping the lugs on the filter condenser. During manufacture of capacitor, the lugs were not tightly crimped to the terminal pins leading from capacitors to terminal board.

Westinghouse Models H-125, H-126 may develop an intermittent drop in signal strength accompanied by an increase of background noise. This can be caused by the 47 mmf. capacitor coupling the plate of the RF tube (12SK7) to the grid of the converter type 12SA7. This capacitor will intermittently open causing the above condition. The item part number is RMC-20A470M." (Photofact Item No. 22)

PUBLICATION DATES

When will other sets of PHOTOFACT Folders be published?

Volume 3—Set No. 24 ..... **September 15**
Volume 3—Set No. 25 ..... **October 15**
Volume 3—Set No. 26 ..... **October 15**
Volume 3—Set No. 27 ..... **November 15**

If you have been unable to get any issues of PHOTOFACT *Folder Sets, send your order and money directly to us and we will see that you are supplied.*

AIR KING
MODEL A-400

AIR KING
MODEL A-400

AIR KING MODEL A-400

TRADE NAME	Air King, Model A-400 (Ch. 470)
MANUFACTURER	Air King Products Co., Inc., 1523 63rd St., Brooklyn, N.Y.
TYPE SET	AC-DC Operated Superheterodyne Receiver
TUBES (FOUR)	Types, 12SA7GT Converter, 12SQ7GT Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	110-125 Volts AC-DC
TUNING RANGE—BROADCAST	535-1600KC RATING .260 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD. capacitor in series with low side of signal generator and chassis. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting..

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to stator of rear section of tuning cap. Low side to chassis.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2,	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD. to reduce hum modulation.
2	200 MMF.	High side to ext. ant. lead. Low side to chassis.	1600KC	"	"	A3	Adjust for maximum output.
3	200 MMF.	"	1400KC	Tune for maximum output.	"	A4	" " " "

HOWARD W. SAMS & CO., INC. • 2924 East Washington Street • Indianapolis 6, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIR KING PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7GT	12SA7GT	8AD	
2	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
3	Power Output	50L6GT	50L6GT	7AC	
4	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIR KING PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
5A	50	150	2073	UP5315	FP214	DY5030-150	EL-35	AF88D	■ Filter
B	30	150							▲ "
6	.05	400		DT4S1	TP426	MPH-4-05	TC-15	484-05	Line Filter
7	.02	400		DT4S2	TP423	S-4-02	TC-12	484-02	Output Plate Bypass
8	.02	400		DT4S2	TP423	S-4-02	TC-12	484-02	Audio Coupling
9	.001	600		DT6D1	TP404	S-6-001	TC-21	684-001	AF Plate Bypass
10	.002	400		DT6D2	TP405	S-6-002	TC-22	484-002	Audio Coupling
11	.05	400		DT4S5	TP426	S-4-05	TC-15	484-05	AVC Filter
12	.001	500		DT6D1	TP404	S-6-001	TC-21	684-001	Ext. Ant. Coupling
13	100			5WS71	MC235	MO.5-31	1FM-31	1468-0001	Diode Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIR KING PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
14A	2 Meg.	½	2479	MR-55	D13-139	M-66-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 14A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

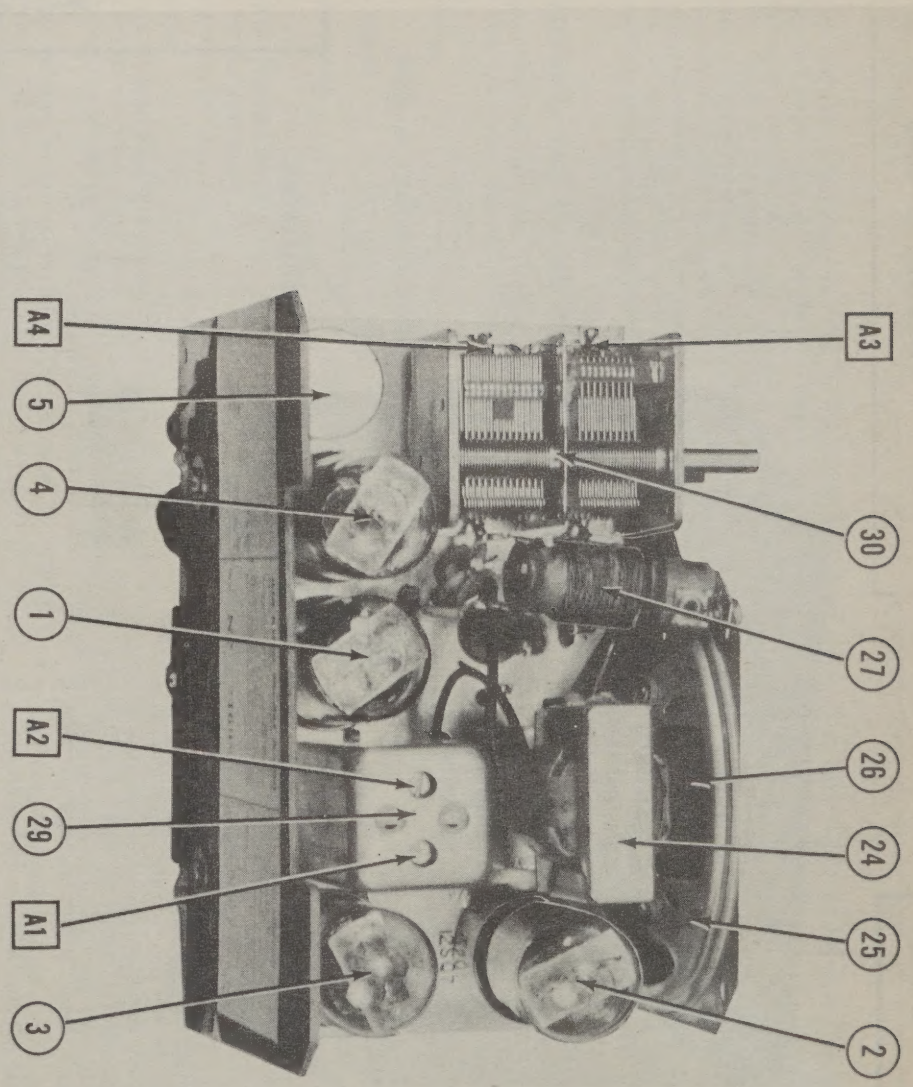
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIR KING PART No.	IRC PART No.	IDENTIFICATION CODES
15	250K	½		BTS-220K	Red-Grn.-Yl. Ant. Primary Shunt
16	18K	½		BTS-18K	Br.-Grn.-Or. Osc. Grid
17	4.7 Meg.	½		BTS-4.7 Meg.	Yl.-Vi.-Grn. AVC Network
18	4.7 Meg.	½		BTS-4.7 Meg.	Yl.-Vi.-Grn. AF Grid
19	220K	½		BTS-220K	Red-Red-Yl. AF Plate Load
20	330K	½		BTS-330K	Or.-Or.-Yl. Output Grid
21	3300Ω	1		BTA-3300	Or.-Or.-Red Filter
22	27Ω	½		BW-½-27	Red-Vi.-Blk. Line Dropping
23	18Ω	½		BW-½-18	Br.-Grn.-Blk. Rectifier Ballast

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: AIR KING PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
24	3100Ω	3.5Ω	245Ω	.5Ω	Part of 5877	A-3876*	T22S45*		*Bend mounting tabs down, file out slots and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: AIR KING PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD-	VC IMP.		ST-113		
25	PM	3.5Ω	5877	Mod. P4-X		
	CONE DIA.	VC DIA.				
26	4"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

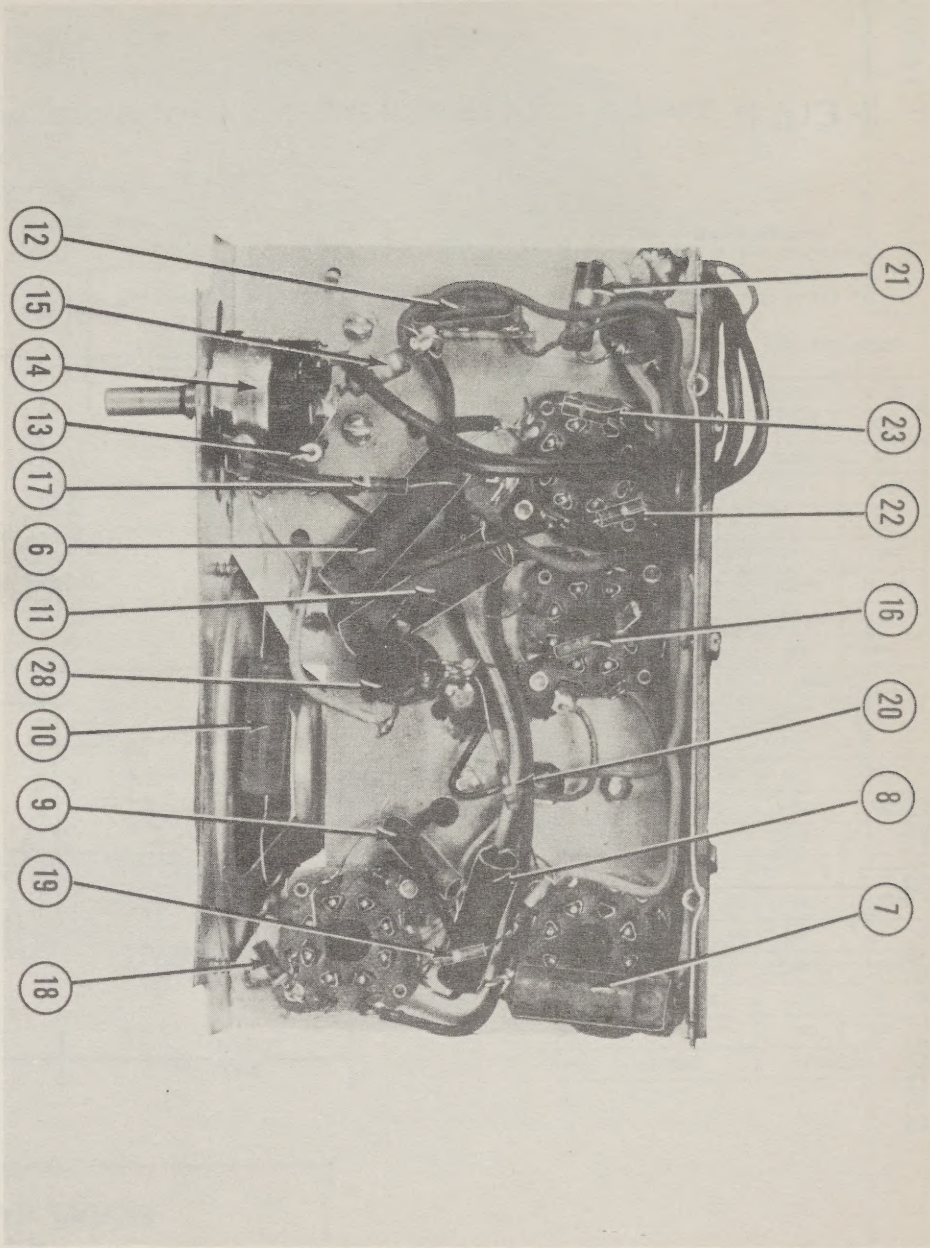
R F COILS

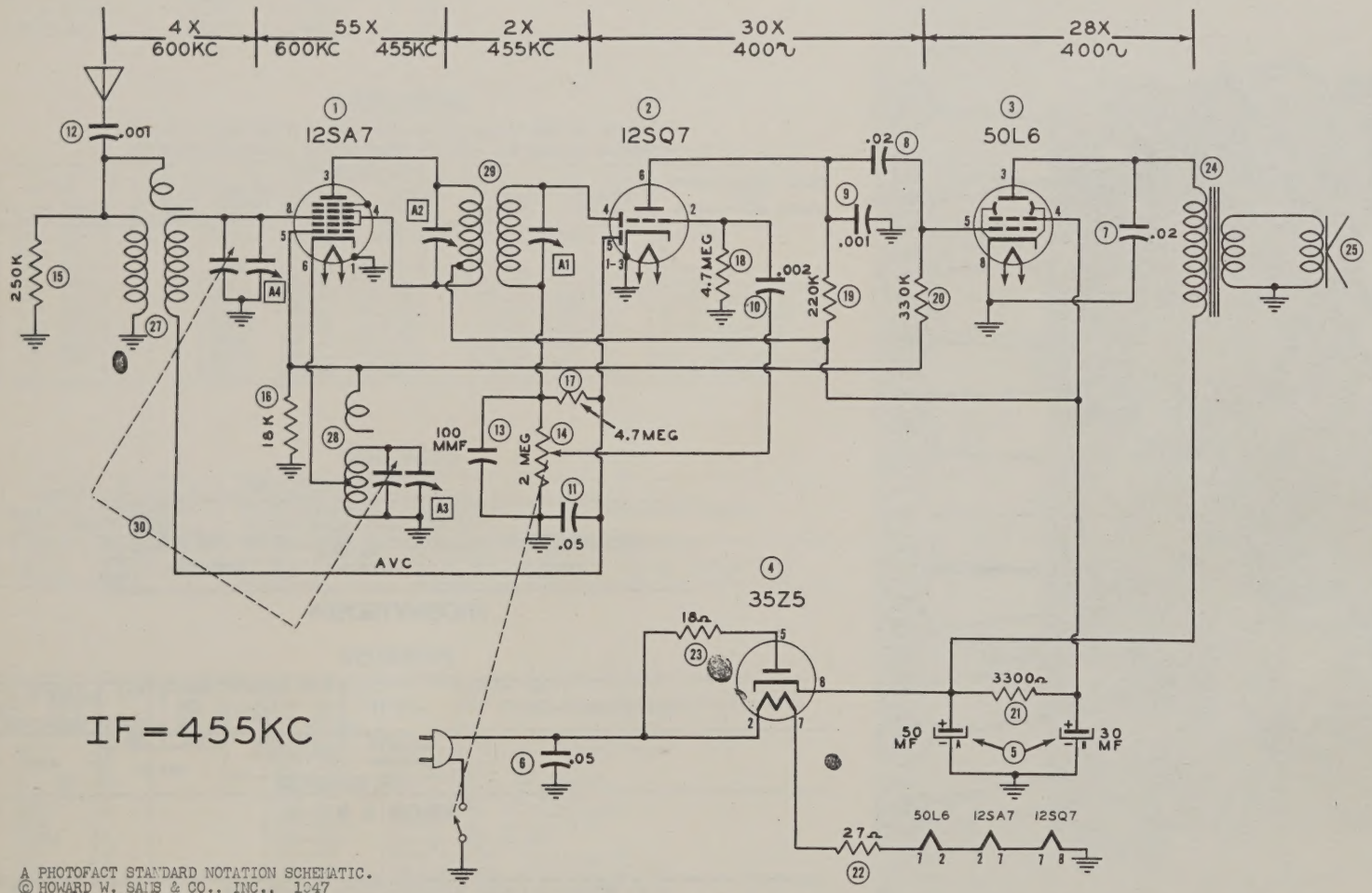
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: AIR KING PART No.	MEISSNER PART No.	
27	Ant. Coil	60Ω	5Ω	28185		
28	Osc. Coil		9Ω	28184	14-1040	Add 50MMFD from osc. grid to high side tuning cap.
29	IF Trans.	26Ω	26Ω	3376		

MISCELLANEOUS

ITEM No.	PART NAME	AIR KING PART No.	NOTES
30	2 Gang Var. Cap.	1673A	(27-190 MMF, 10-428 MMF)
	Knob	39156	Tuning
	Knob	39157	Volume

CHASSIS—BOTTOM VIEW





Pin No.	12SA7GT Volt.	12SA7GT Res.	12SQ7GT Volt.	12SQ7GT Res.
1	0V.	0Ω	0V.	0Ω
2	26VAC	26Ω	-.75VDC	5 Meg.
3	80VDC	1.5 Meg.	0V.	0Ω
4	80VDC	1.5 Meg.	-.5VDC	2 Meg.
5	-4.8V§	18KΩ	-.55VDC	7 Meg.
6	0V.	.5Ω	57VDC	1.8 Meg.
7	14VAC	13Ω	14VAC	13Ω
8	-.55VDC	7 Meg.	0V.	0Ω

Pin No.	50L6GT Volt.	50L6GT Res.	35Z5GT Volt.	35Z5GT Res.
1	0V.	0Ω	-.55VDC	7 Meg.
2	26VAC	26Ω	117VAC	130Ω
3	117VDC	1.5 Meg.	110VAC	122Ω
4	80VDC	1.5 Meg.	0V.	INF
5	-4.6V§	350KΩ	116VAC	150Ω
6	0V.	INF	77VAC	75Ω
7	76VAC	75Ω	77VAC	100Ω
8	0V.	0Ω	125VDC	1.5 Meg.

§TAKEN WITH VACUUM TUBE VOLTMETER.

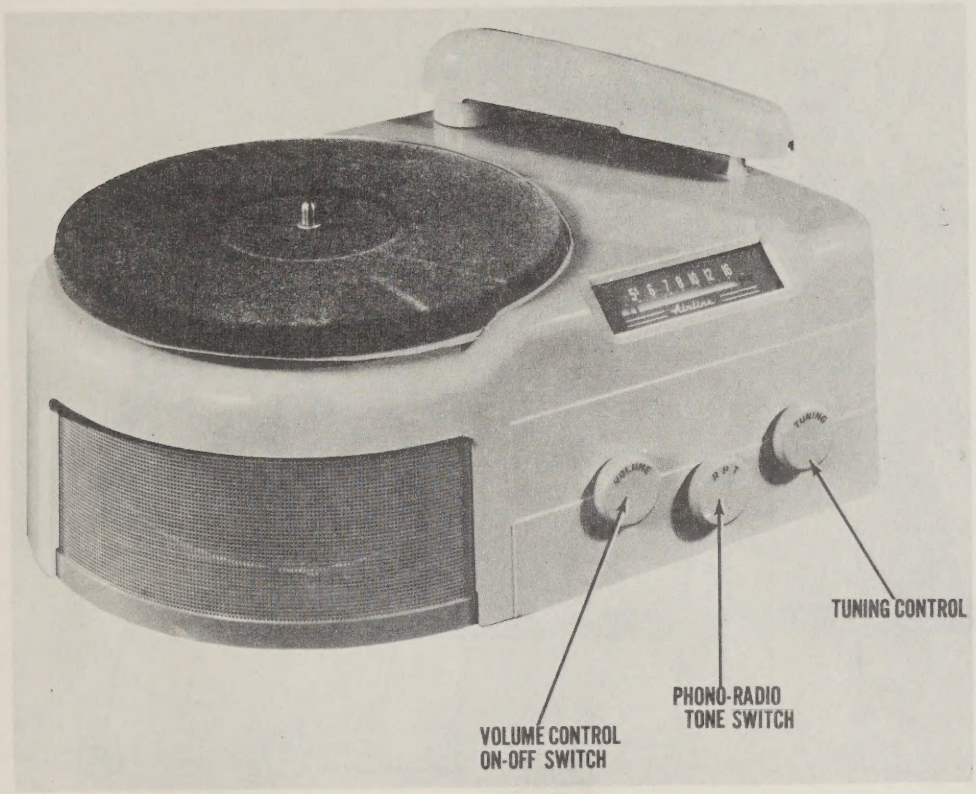
RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC.
© HOWARD W. SAMS & CO., INC., 1047

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE 4713-1

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



AIRLINE
MODEL 74 BR-2001 B

AIRLINE
MODEL 74 BR-2001 B

AIRLINE MODEL 74BR-2001B

TRADE NAME	Airline, Model 74BR-2001B
MANUFACTURER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	AC Operated Radio-Phono Combination
TUBES (FIVE)	Types, 12BE6 Converter, 12BD6 IF Amp., 12AT6 Det.-AVC-AF, 50B5 Power Output, 35W4 Rectifier.
POWER SUPPLY	105-125 Volts AC
TUNING RANGE—BROADCAST	535-1690KC RATING .250 Amps. @ 117 V AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to first reference mark at left end of dial backplate. Use isolation transformer if available. If not connect a .1 MFD. capacitor in series with low side of signal generator and B-. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to ant. plate. Low side to B-.	455KC	Slugs out completely.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2	.1 MFD.	"	1690KC	"	"	A5	Adjust for maximum output.
3	200 MMFD	High side to ext. ant. lead. Low side to B-.	"	"	"	A6	" " " "
4	200MMFD	"	1400KC	1400KC	"	Ant.Coil (41)	Adjust position of ant. coil for maximum output.
5	200MMFD	"	1690KC	Slugs out completely.	"	A6	Adjust for maximum output. Repeat Steps 4 and 5 until no further output can be obtained.

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PARTS LIST AND DESCRIPTIONS

AIRLINE MODEL 74BR-2001B

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12BE6	12BE6	7CH	
2	IF Amp.	12BD6	12BD6	7CC	
3	Det.-AVC-AF	12AT6	12AT6	7BT	
4	Power Output	50B5	50B5	7BZ	
5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: SOLAR PART No.	REPLACEMENT DATA: SPRAGUE PART No.	REPLACEMENT DATA: AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	40	150	A-8C-10937	UP6CJ44	FP357	DY-403020-150	EL-224	AF844D	■ Filter
B	20	150							▲ "
C	20	150							"
7	.1	400	C-8D-10760	DT4P1	TP428	S-4-1	TC-1	484-.1	Line Filter
8	.09	400	C-8D-11251	DT4P1	TP428	S-4-1	TC-1	484-.1	Line Isolation
9	.01	400	C-8D-10761	DT4S1	TP421	S-4-01	TC-11	484-01	Output Plate Bypass
10	.01	400	C-8D-10761	DT4S1	TP421	S-4-01	TC-11	484-01	Audio Coupling
11	.002	600	C-8D-10778	DT6D2	TP405	S-6-002	TC-22	684-002	" "
12	.1	400	C-8D-10760	DT4P1	TP428	S-4-1	TC-1	484-.1	RF Bypass Pwr. Supp.
13	.05	200	C-8D-10770	DT4S5	TP426	S-4-05	TC-15	484-05	AVC Filter
14	.025	400	C-8D-10997	DT4S25	TP451	S-4-025	TC-13	484-025	Tone Compensationn
15	100	500	C-8F3-8	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Audio Plate Bypass
16	100	500	C-8F3-8	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Diode Filter
17	100	500	C-8F3-8	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Osc. Grid Capacitor
18	820	500	C-8F3-247						Fixed Padder
19	100	500	C-8F3-8	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Ext. Ant. Coupling
20	330	500	C-8F3-119	5W5T3	MC241	MO.5-333	1FM-335	1468-0003	RF Coupling

CONTROLS

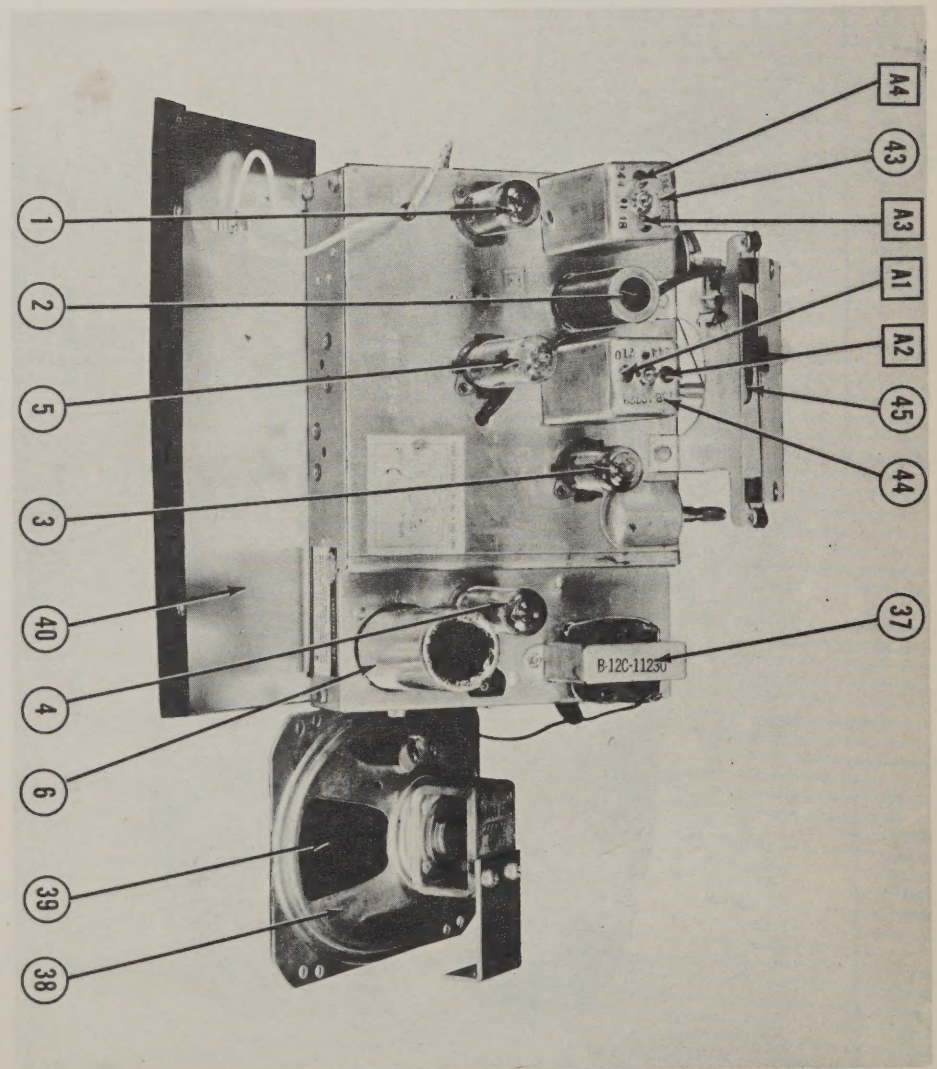
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
21A	500KΩ	1		MK401	D13-133	AM-60-Z	Volume Control-See Note 1
B	Shaft			Not Req.	E	KSS-3	Attach to 21A per instructions
C	Switch			M26	41	SW-A	" " " " "
21A	1 Meg.	1	A-10A-11332	MK402	D13-137	AM-63-Z	Volume Control-See Note 2
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 21A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

Note 1 - Used in later production.
Note 2 - Used in early production.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
22	100Ω	½	C-9B1-7	BW-½-100	Br.-Blk.-Br. Parasitic Suppressor
23	22KΩ	½	C-9B1-78	BTS-22K	Red-Red-Or. Oscillator Grid
24	220KΩ	½	C-9B1-27	BTS-220K	Red-Red-Yl. AVC Network
25	100Ω	½	C-9B1-50	BW-½-100	Br.-Blk.-Br. IF Cathode
26	3.3 Meg.	½	C-9B1-34	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
27	47KΩ	½	C-9B1-23	BTS-47K	Yl.-Vi.-Or. Series Volume Control
28	15 Meg.	½	C-9B1-302	BTS-15 Meg.	Br.-Grn.-Blue AF Grid
29	220KΩ	½	C-9B1-27	BTS-220K	Red-Red-Yl. AF Plate Load
30	560KΩ	½	C-9B1-95	BTS-560K	Grn.-Blue-Yl. Output Grid
31	150Ω	½	C-9B1-52	BW-½-150	Br.-Grn.-Br. Output Cathode
32	1200Ω	1	C-9B2-63	BTA-1200	Br.-Red-Red Filter
33	220Ω	1	C-9B2-54	BW-1-220	Red-Red-Br. Filter
34	27Ω	½	C-9B1-43	BW-½-27	Red-Vi.-Blk. Surge Limiter
35	33Ω	1	C-9B2-44	BW-1-33	Or.-Or.-Blk. Line Dropping
36	560KΩ	½	C-9B1-95	BTS-560K	Grn.-Blue-Yl. Series Phono

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRLINE PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
37	2300Ω	3.0Ω	190Ω	.7Ω	B-13C-11130	A-3-76	T22S45		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AIRLINE PART No.	JENSEN PART No.		
38	FIELD PM	VC IMP. 3.0Ω	B-18A-11219			
39	CONE DIA. 4"x6"	VC DIA. 1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	AIRLINE PART No.	MEISSNER PART No.	
40	Ant. Plate			B-23J-11220		
41	Ant. Coil		10Ω	C-21I-11222		Items 41 & 42 are slug tuned and ganged together and are part of tuning assy.
42	Osc. Coil	.3Ω	7Ω	C-21I-11222		
43	Input IF	25Ω	23Ω	B-13A-10723-1	16-6666	
44	Output IF	25Ω	25Ω	B-13B-10729	16-6667	

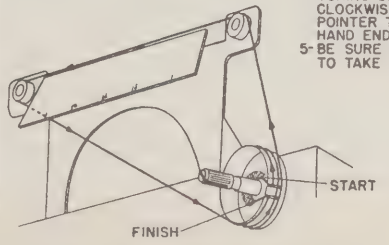
DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					AIRLINE PART No.		
45	Bayonet	6-8	0.15	Brown	A-46A-10793		Type 47

MISCELLANEOUS

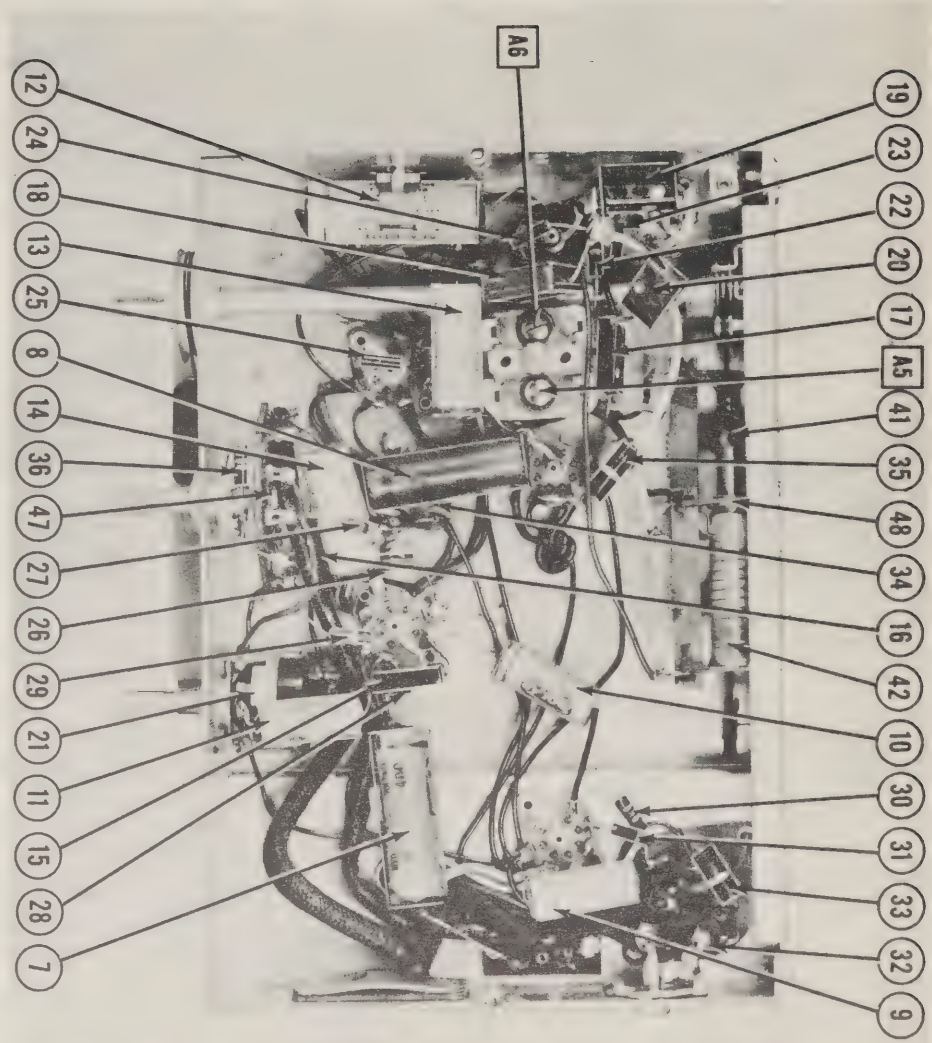
ITEM No.	PART NAME	AIRLINE PART No.	NOTES
46	Switch	A-3CA-11114	Radio-Phono-Tone
47	Tuner Assby.		
A5	Trimmer Assby.	A-8E-11240	Osc. Adj.
A6			Ant. Adj.
	Dial Scale	B-6D-11241	
	Pointer	A-2G-11123	
	Knob, Ivory	B-5B-13170-8	"Tuning"
	" "	B-5B-13171-8	"Volume"
	" "	B-5B-13172-8	"Radio-Phono-Tone"
	Phono Motor	C-20I-11406-3	Includes Turntable Assby.
	Cabinet	C-8C-11329-9	
	Phono Cartridge	8K-11885	

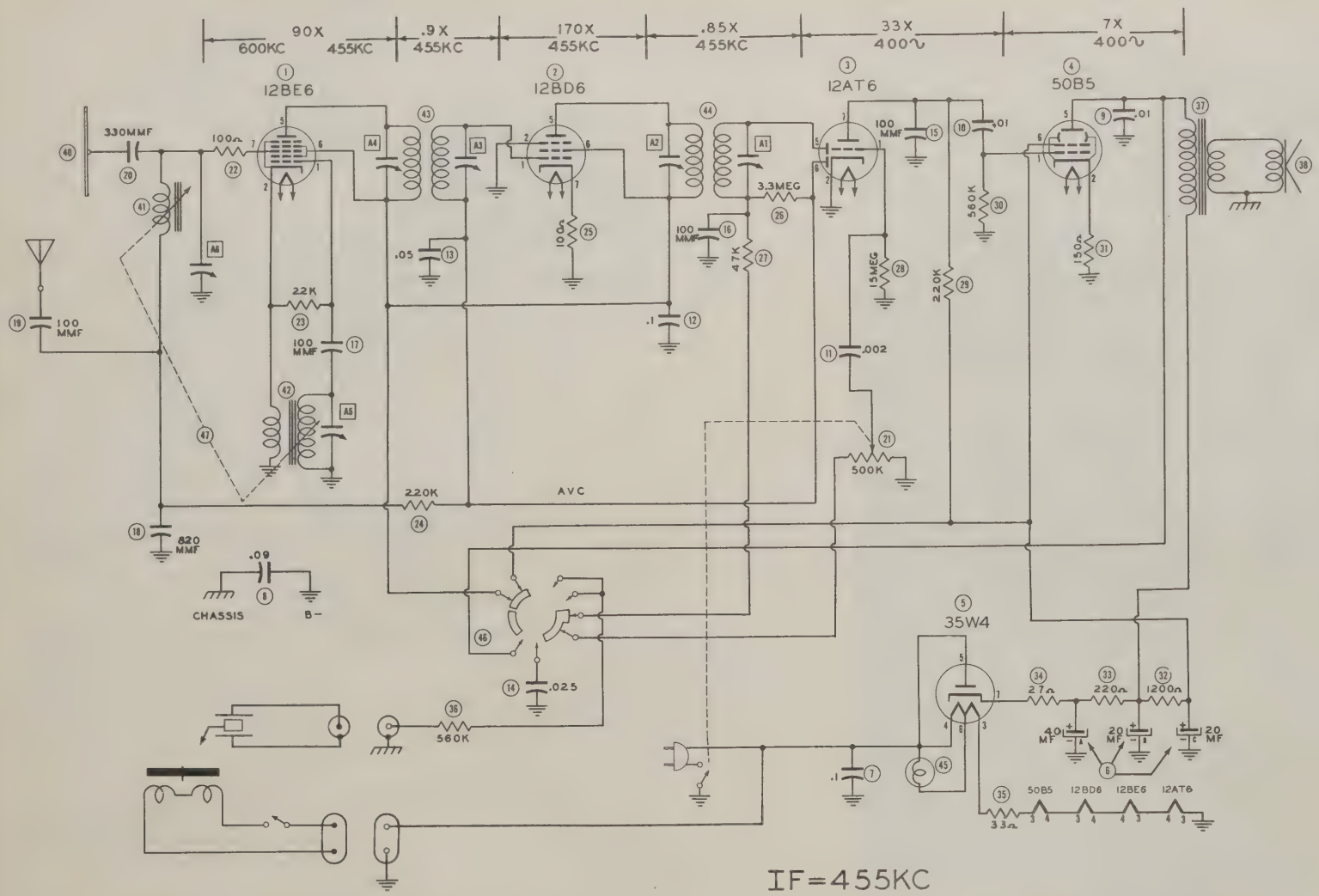
REPLACING DIAL STRING



1-START AT SPRING
2-WRAP 2 TURNS COUNTER CLOCKWISE AROUND DRIVE PULLEY
3-GO AROUND IDLER PULLEYS BACK TO DRIVE PULLEY AND FINISH AT SPRING
4-TO SET POINTER ROTATE TUNING SHAFT TO EXTREME CLOCKWISE POSITION, FASTEN POINTER TO STRING AT RIGHT HAND END MARKER
5-BE SURE SPRING IS STRETCHED TO TAKE UP SLACK

CHASSIS—BOTTOM VIEW





IF=455KC

RADIO-PHONO SWITCH IN RADIO POSITION.

Pin No.	12BE6 Volt.	12BE6 Res.	12BD6 Volt.	12BD6 Res.
1	-9VDC$	22KΩ	-.4VDC	3.6 Meg.
2	0V.	.5Ω	0V.	0Ω
3	11VAC	12Ω	34VAC	33Ω
4	23VAC	23Ω	23VAC	23Ω
5	83VDC	60KΩ	83VDC	60KΩ
6	83VDC	60KΩ	83VDC	60KΩ
7	-.1VDC	4 Meg.	1.1VDC	110Ω

Pin No.	12AT6 Volt.	12AT6 Res.	50B5 Volt.	50B5 Res.
1	-.6VDC	15 Meg.	0V.	550KΩ
2	0V.	0Ω	5.8VDC	140Ω
3	0V.	0Ω	82VAC	82Ω
4	11VAC	12Ω	34VAC	33Ω
5	-.4VDC	510KΩ	102VDC	60KΩ
6	-.4VDC	3.6 Meg.	83VDC	60KΩ
7	53VDC	280KΩ	0V.	550KΩ

Pin No.	35W4 Volt.	35W4 Res.
1	0V.	INF
2	82VAC	82Ω
3	87VAC	115Ω
4	117VAC	140Ω
5	117VAC	140Ω
6	113VAC	136Ω
7	123VDC	60KΩ

$TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

4713-2

A PHOTOFACT STANDARD NOTATION SCHEMATIC.

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THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

SUPPLEMENT

ARVIN MODEL 444M, 444AM (Ch. RE-200M)

These models are the same as Models 444 and 444A (Set 1 - Photofact Folder No. 461-3) with the exceptions listed below.

ARVIN SUPPLEMENT
444 M, 444 AM

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		ARVIN PART No.	STANDARD REPLACEMENT		
1	Converter	12BE6	12BE6	7CH	
2	Det.-AVC-AF	12AT6	12AT6	7BT	
3	Power Output	50B5	50B5	7BZ	
4	Rectifier	35W4	35W4	5BQ	

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ARVIN PART No.	IRC PART No.	
21	470K	½		BTS-470K	Y1.-V1.-Y1. Output Grid

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	12BE6	-10.2VDC§	0V.	62VAC	75VAC	100VDC	100VDC	0V.
2	12AT6	-.7VDC	0V.	0V.	12VAC	-.4VDC	0V.	50VDC
3	50B5	0V.	7VDC	12VAC	62VAC	122VDC	100VDC	0V.
4	35W4	75VAC	0V.	117VAC	83VAC	117VAC	90VAC	130VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	12BE6	20KΩ	.5Ω	60Ω	70Ω	80KΩ	80KΩ	7 Meg.
2	12AT6	15 Meg.	0Ω	0Ω	12Ω	1.8 Meg.	7 Meg.	550KΩ
3	50B5	440KΩ	150Ω	12Ω	60Ω	80KΩ	80KΩ	440KΩ
4	35W4	70Ω	INF	145Ω	115Ω	145Ω	120Ω	80KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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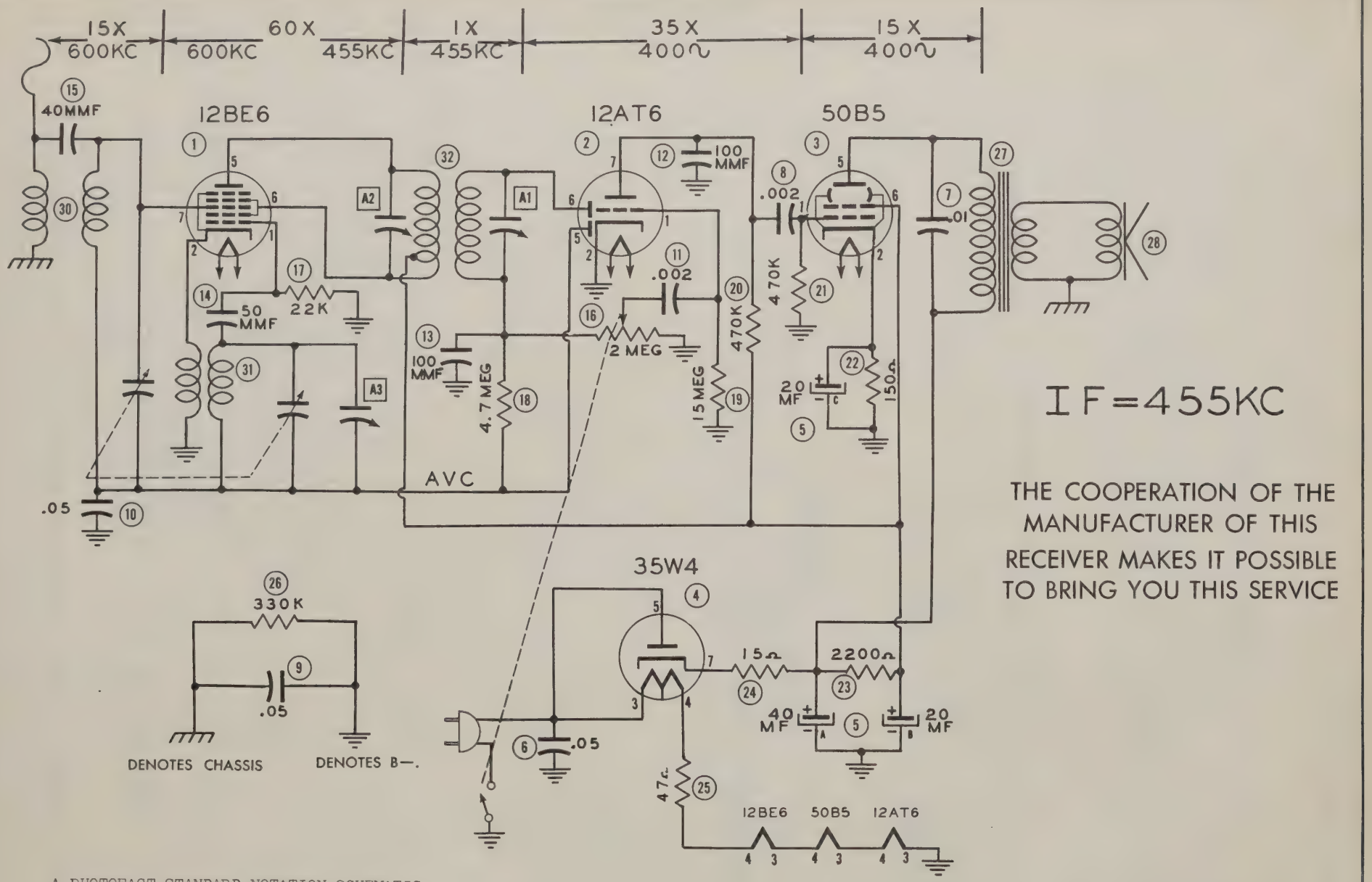

A PHOTOFACT STANDARD NOTATION SCHEMATIC.
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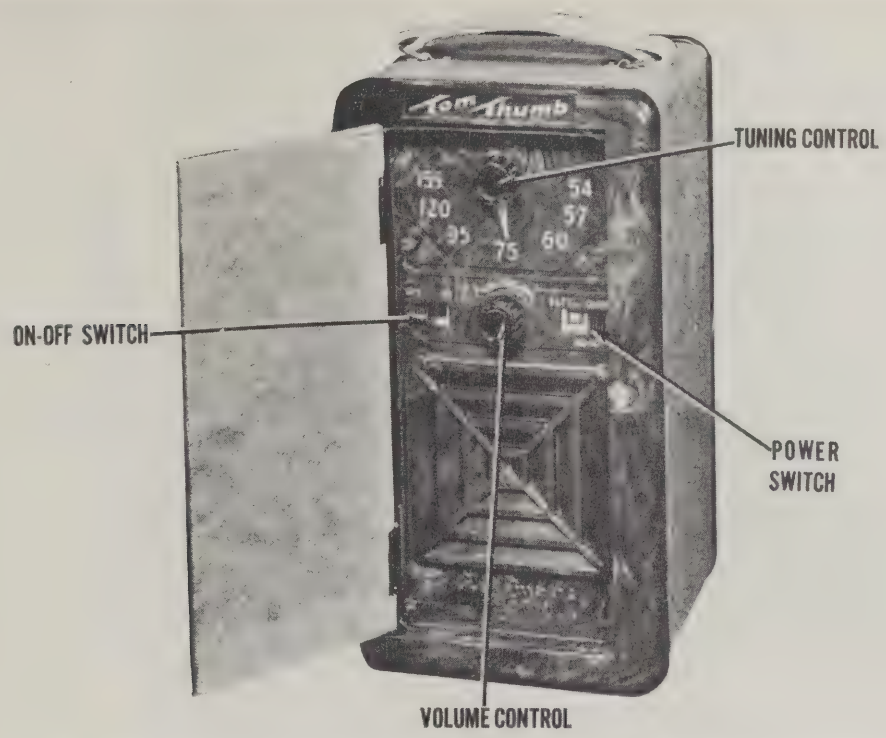
4713-3

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.



AUTOMATIC
MODEL ATTP (TOM THUMB)
(BATTERY OPERATED)

AUTOMATIC
MODEL ATTP (TOM THUMB)
(BATTERY OPERATED)

AUTOMATIC MODEL ATTP

TRADE NAME	Automatic Tom Thumb Personal Model ATTP
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston 15, Mass.
TYPE SET	Three Power Portable Superheterodyne with Loop Antenna
TUBES (FOUR)	Types, 1R5 Converter, 1T4 IF Amp., 1S5 Det.-AVC-AF, 3S4 Power Output
POWER SUPPLY	110-120 V AC-DC or 67½ V. "B" Supply & 7½ V "A" Supply
RATING	.170 Amp. @ 117V AC or 15MA @ 67½ V DC & 51MA @ 7½ V DC
TUNING RANGE—BROADCAST	530-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Connect jumpers from contact pin leads on chassis to contact connections on inside of case. Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1 MFD capacitor in series with the low side of signal generator and B-. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning cap. Low side to chassis.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy ant. to 200 MMF to reduce hum modulation.
2	.1 MFD.	"	1600KC	"	"	A5	Adjust for maximum output.
3		Loop	1400KC	Tune for maximum output.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. (This adjustment may not be found on some models.)

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PARTS LIST AND DESCRIPTIONS

AUTOMATIC TOM CHIEF PERS... TYP

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AUTOMATIC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	1R5	1R5	7AT	
2	IF Amp.	1T4	1T4	6AR	
3	Det.-AVC-AF	1S5	1S5	6AU	
4	Power Output	3S4	3S4	7BA	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AUTOMATIC PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
5A	30	150	CE-60						■ Filter
B	25	150							▲ "
C	200	10							Filament Bypass
6	.05	600		DT6S5	TP415	S-6-05	TC-15	684-05	Line Filter
7	.002	600		DT6D2	TP405	S-6-002	TC-22	684-002	Output Plate Bypass
8	.002	600		DT6D2	TP405	S-6-002	TC-22	684-002	Audio Coupling
9	.05	400		DT4S5	TP426	S-4-05	TC-15	484-05	Audio Screen Bypass
10	.002	600		DT6D2	TP405	S-6-002	TC-22	684-002	Audio Coupling
11	.05	150		ZN1S5	MT135	TTF-15-05			Filament Bypass
12	.05	200		DT4S5	TP426	S-4-05	TC-15	484-05	Screen Bypass
13	.05	200		DT4S5	TP426	S-4-05	TC-15	484-05	AVC Filter
14	100	500		5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Audio Plate Bypass
15	100	500		5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Osc. Grid Capacitor
44	200	500		5W5T2	MC237	MO.5-32	1FM-32	1468-0002	Diode Filter

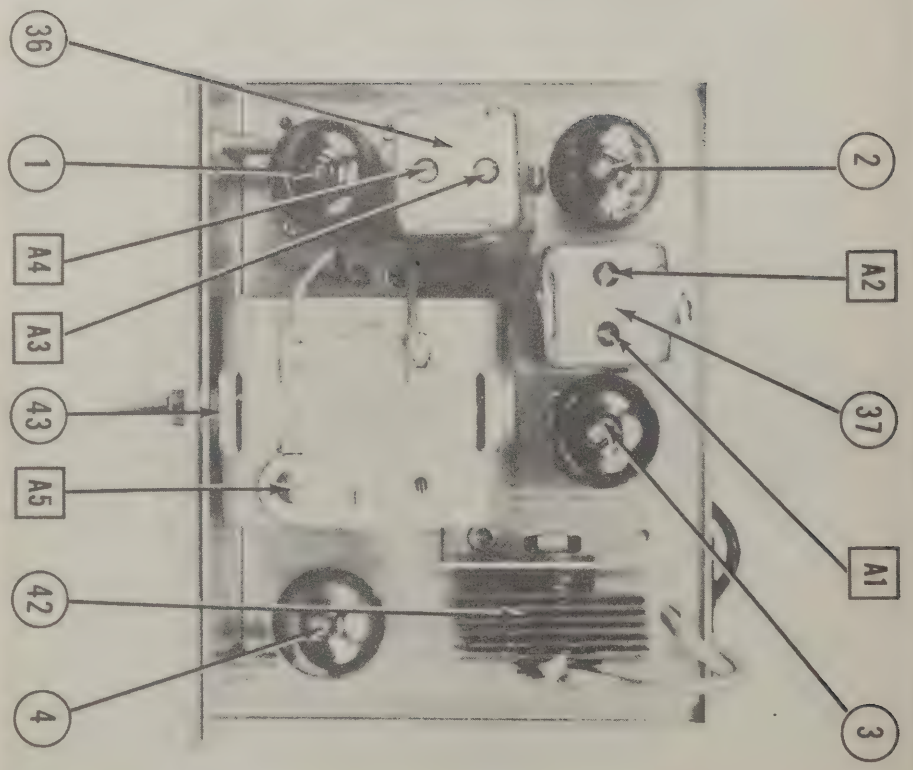
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUTOMATIC PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
16A	750KΩ	1	RV47	MR51	D13-137	M-63-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 16A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUTOMATIC PART No.	IRC PART No.	IDENTIFICATION CODES
17	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Oscillator Grid
18	12KΩ	½		BTS-12K	Br.-Red-Or. Screen Dropping
19	1000Ω	½		BTS-1000	Br.-Blk.-Red Filament String
20	1 Meg.	½		BTS-1 Meg.	Br.-Blk. Grn. IF Grid
21	600Ω	½		BTS-560	Blue-Blk.-Br. Filament String
22	2 Meg.	½		BTS-2.2 Meg.	Red-Blk.-Grn. AVC Network
23	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue AF Grid
24	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue AF Screen Dropping
25	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AF Plate Load
26	2 Meg.	½		BTS-2.2 Meg.	Red-Blk.-Grn. Output Grid
27	450Ω	½		BTS-470	Yl.-Grn.-Br. Filament String
28	2000Ω	½		BTS-2200	Red-Blk.-Red Series Battery Charge
29	3600Ω	½		BTS-3900	Or.-Blue-Red Filter
30	50Ω	5		AB-50	Rectifier Ballast

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AUTOMATIC PART No.	STANCOR PART No.	THORDARSON PART No.		
	PRI.	SEC.	PRI.	SEC.					
31	4600Ω	3.2Ω	410Ω	.5Ω	Part of PM-604	A-3876*	T22S45*		*Bend mounting tabs down, file out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AUTOMATIC PART No.	JENSEN PART No.		
32	FIELD PM	VC IMP. 3.2Ω	PM-604			
33	CONE DIA. 3-3/8"	VC DIA. 1/2"	NOT READILY	REPLACEABLE-USE COMPLETE SPEAKER UNIT		

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	AUTOMATIC PART No.	MEISSNER PART No.	
34	Loop Ant.		2Ω			
35	Osc. Coil	1Ω	6Ω		14-1040	
36	Input IF	33Ω	34Ω		16-6668	
37	Output IF	34Ω	32Ω		16-6669	Add 200MMFD from high side volume control to ground.

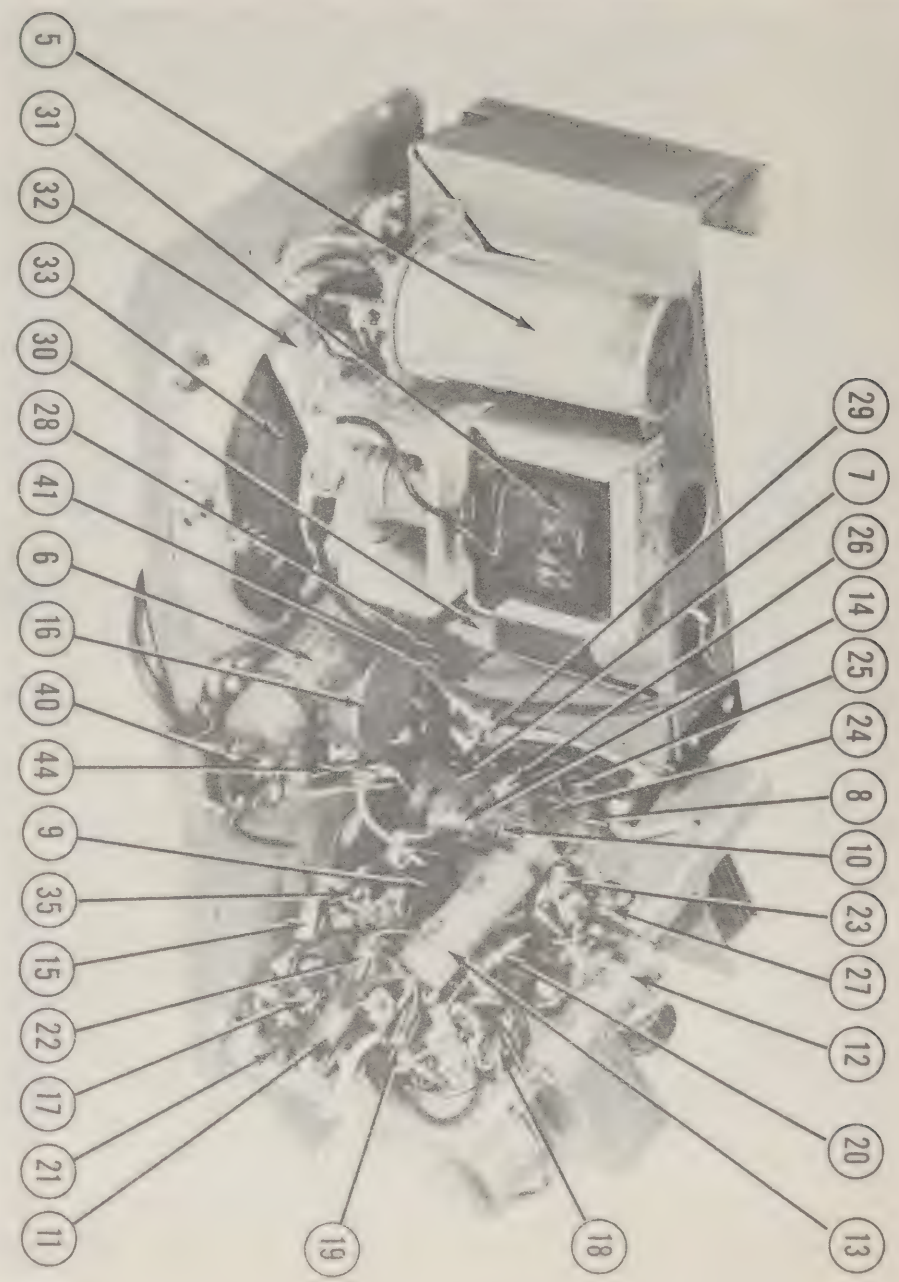
BATTERIES

ITEM No.	VOLTAGE	AUTOMATIC PART No.	EVEREADY			INSTALLATION NOTES
			"A"	"B"	"A-B"	
38	1.5 V "A"		(5) #1035			Five 1½ Volt Batteries in Series
39	67.5V "B"			#467		

MISCELLANEOUS

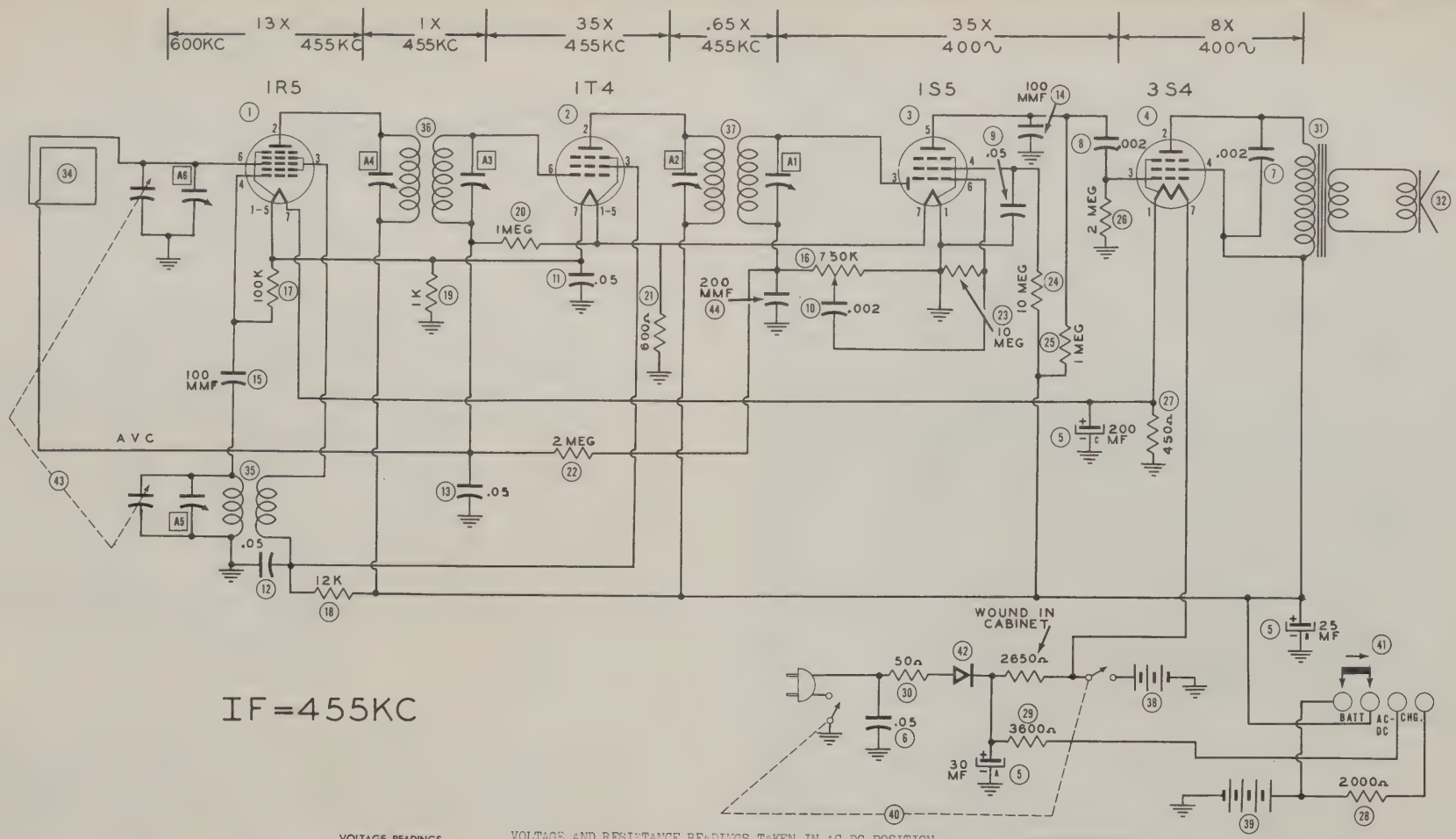
ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
40	Switch	SW76	On-Off
41	"	SS7	Batt.-AC/DC-Charge
42	Rectifier	SR-100	Selenium
43	Tuning Cap.		(15-367 MMF, 24-141 MMF)

CHASSIS—BOTTOM VIEW



AUTOMATIC TONE THUMB PERSONAL ATTP

AUTOMATIC TOM THUMB PERSONAL ATTP



IF=455KC

VOLTAGE READINGS

VOLTAGE AND RESISTANCE READINGS TAKEN IN AC-DC POSITION.

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	2.6VDC	66VDC	43VDC	-2.6VDC	2.6VDC	.2VDC	4.6VDC
2	1T4	1.4VDC	66VDC	43VDC	66VDC	1.4VDC	.2VDC	2.9VDC
3	1S5	0V.	.2VDC	-.1VDC	13VDC	25VDC	-.1VDC	1.4VDC
4	3S4	4.6VDC	66VDC	0V.	66VDC	6.2VDC	66VDC	7.6VDC

$TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	*	6.2KΩ	18KΩ	100KΩ	*	850KΩ	*
2	1T4	*	6.2KΩ	18KΩ	6.2KΩ	*	850KΩ	*
3	1S5	0Ω	850KΩ	600KΩ	10 Meg.	1 Meg.	10 Meg.	*
4	3S4	*	6.8KΩ	2 Meg.	6.2KΩ	*	6.8KΩ	*

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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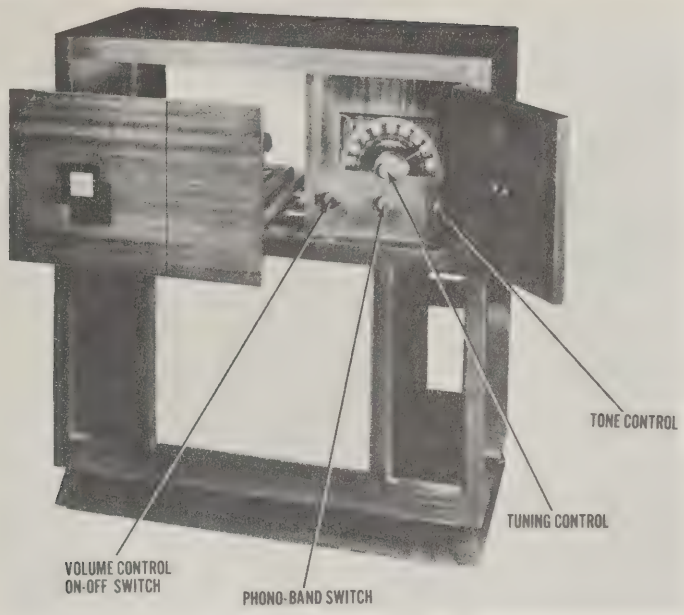
4713-4

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting high side of volume control to chassis.

1. DC Voltage measurements are at 20,000 ohms per volts; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



AUTOMATIC MODEL F-790

TRADE NAME	Automatic, Model F-790
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston, Mass.
TYPE SET	AC Operated Radio-Phono Combination Superheterodyne with Loop Antenna
TUBES (NINE)	Types, 12SK7 RF Amp., 12SA7 Converter, 12SK7 IF Amp., 12SQ7 Det.-AVC-AF, 12SQ7 Phase Inv., (2) 50L6GT Power Output, (2) 35Z5GT Rectifier.
POWER SUPPLY	110-120 Volts AC
TUNING RANGE—BROADCAST	540-1700KC RATING .530 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial. Use isolation transformer if available. If not, connect a .1 MFD capacitor in series with low side of signal generator and chasssis. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning cap. Low side to chassis.	455KC	1600KC	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD. to reduce hum modulation.
2	200MMFD	High side to ext. ant. lead. Low side to chassis.	"	550KC	"	A5	Adjust for minimum output.
3	200MMFD	"	1600KC	1600KC	"	A6	Adjust for maximum output.
4	200MMFD	"	1400KC	Tune for maximum output.	"	A7	" " " "

DISASSEMBLY INSTRUCTIONS

1. Remove four push on type control knobs.
2. Remove three lock nuts from control shafts.
3. Remove ten Phillips head screws holding cover board to back of chassis. Remove board
4. Remove phono-motor plug.
5. Remove phono-pickup plug from chassis.
6. Remove one bolt holding loop antenna in cabinet.
7. Unsolder four leads at speaker.
8. Unsolder three leads to loop antenna. Remove loop from cabinet.
9. Remove one Phillips head screw holding pilot light in phono compartment
10. Remove one Phillips head screw holding chassis in cabinet. Remove chassis from cabinet.

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PARTS LIST AND DESCRIPTIONS

AUTOMATIC
MODEL F-790

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AUTOMATIC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.		12SK7	8N	
2	Converter		12SA7	8R	
3	IF Amp.		12SK7	8N	
4	Det.-AVC-AF		12SQ7	8Q	
5	Phase Inverter		12SQ7	8Q	
6	Power Output		50L6GT	7AC	
7	" "		50L6GT	7AC	
8	Rectifier		35Z5GT	6AD	
9	"		35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AUTOMATIC PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
10	50	150		BR5015	TC49	M-50-150	UT-501	PRS150-50	Filter
11	50	150		BR5015	TC49	M-50-150	UT-501	PRS150-50	"
12	50	150		BR5015	TC49	M-50-150	UT-501	PRS150-50	"
13	.05	400		DT4S5	TP426	S-4-05	TC-15	484-05	Line Filter
14	.006	600		DT6D6	TP409	S-6-006	TC-26	684-006	Tone Compensation
15	.02	400		DT4S2	TP423	S-4-02	TC-12	484-02	Audio Coupling
16	.1	200		DT4P1	TP428	S-4-1	TC-1	484-.1	Audio Plate Decoup.
17	.02	400		DT4S2	TP423	S-4-02	TC-12	484-02	Audio Coupling
18	.01	600		DT4S1	TP410	S-6-01	TC-11	684-01	" "
19	.1	200		DT4P1	TP428	S-4-1	TC-1	484-.1	AVC Filter
20	.002	600		DT6D2	TP405	S-6-002	TC-22	684-002	Ant. Isolation
21	200	500		5W5T2	MC237	MO.5-32	1FM-32	1468-0002	Audio Plate Bypasss
22	500	500		5W5T5	MC245	MO.5-35	1FM-35	1468-0005	Diode Filter
23	100	500		5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Osc. Grid Capacitor
24	500	500		5W5T5	MC245	MO.5-35	1FM-35	1468-0005	RF Coupling

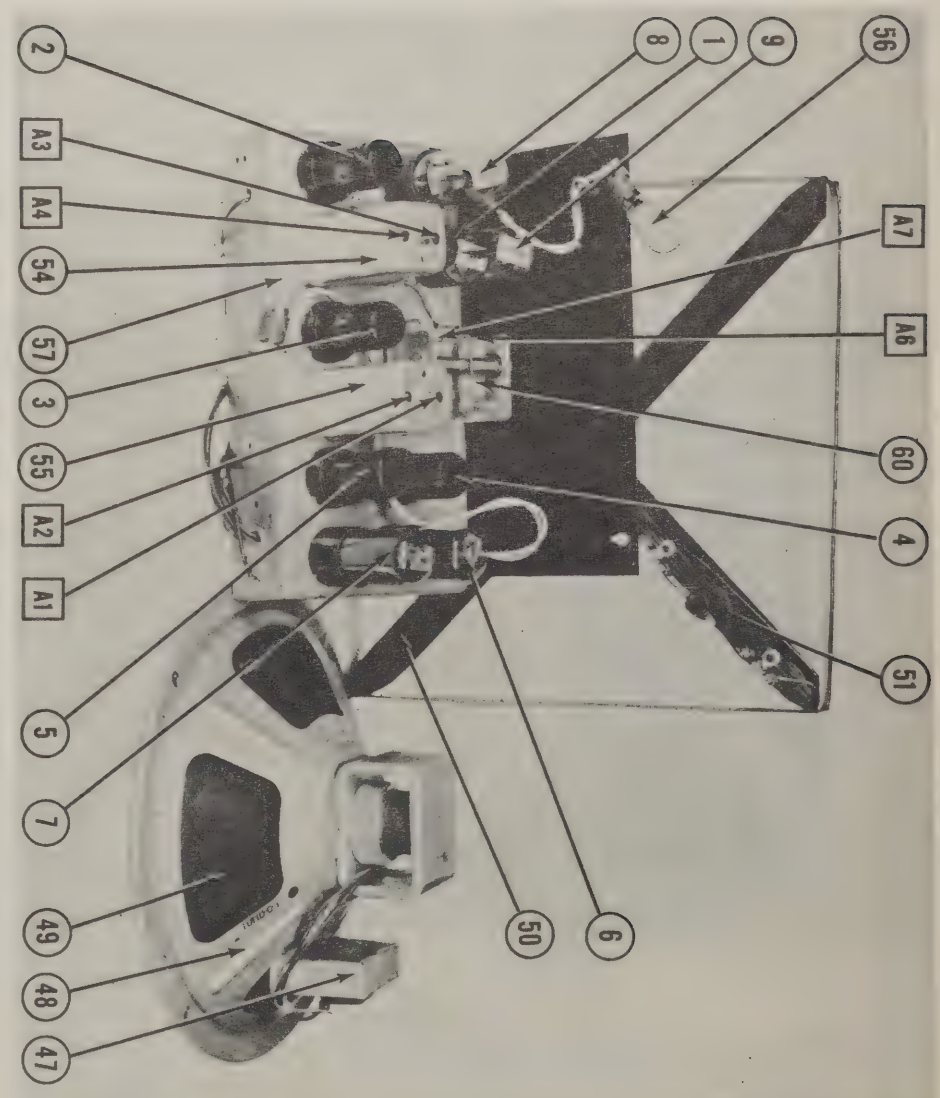
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUTOMATIC PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
25A	250KΩ	1	RV-46	MR44	D13-130	M-64-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 25A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
26A	750KΩ	1		MR51	D13-137	M-63-Z	Tone Control
B	Shaft			Not Req.	A	Not Req.	Attach to 26A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUTOMATIC PART No.	IRC PART No.	IDENTIFICATION CODES
27	4000Ω	½		BTS-3900	Yl.-Blk.-Red RF Plate Load
28	560KΩ	½		BTS-560K	Grn.-Blue-Yl. Converter Grid
29	20KΩ	½		BTS-22K	Red-Blk.-Or. Oscillator Grid
30	2 Meg.	½		BTS-2.2 Meg.	Red-Blk.-Grn. AVC Network
31	250KΩ	½		BTS-270K	Red-Grn.-Yl. Series Phono
32	100Ω	½		BW-½-100	Br.-Blk.-Br. AF Cathode
33	3 Meg.	½		BTS-3.3 Meg.	Or.-Blk.-Grn. AF Grid
34	250KΩ	½		BTS-270K	Red-Grn.-Yl. AF Plate Load
35	250KΩ	½		BTS-270K	Red-Grn.-Yl. AF Plate Decoupling
36	2000Ω	½		BTS-2200	Red-Blk.-Red Tone Compensation
37	4700Ω	½		BTS-4700	Yl.-Vl.-Red Phase Inverter Cathode
38	50KΩ	½		BTS-47K	Grn.-Blk.-Or. Phase Inverter Grid
39	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Phase Inverter Plate Load
40	560KΩ	½		BTS-560K	Grn.-Blue-Yl. Output Grid
41	560KΩ	½		BTS-560K	Grn.-Blue-Yl. Output Grid
42	150Ω	1		BW-1-150	Br.-Grn.-Br. Output Cathode
43	150Ω	1		BW-1-150	Br.-Grn.-Br. Output Cathode
44	1000Ω	2		BT-2-1000	Br.-Blk.-Red Filter
45	120Ω	2		BW-2-120	Br.-Red-Br. Filter
46	50Ω	5		AB-50	Line Dropping

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AUTOMATIC PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
47	4200Ω CT	3.0Ω	250Ω CT	.4Ω	Part of PM-800	A-3423	T22S60		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AUTOMATIC PART No.	JENSEN PART No.		
48	FIELD	VC IMP.	PM-800	ST-119† Mod. P10-T		†Replace output transformer to match 8Ω voice coil..
	PM	3.0Ω				
49	CONE DIA.	VC DIA.	NOT READILY REPLACEABLE - USE COMPLETE SPEAKER UNIT			
	8-3/4"	1"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	AUTOMATIC PART No.	MEISSNER PART No.	
50	Loop Ant.	.1Ω	1.2Ω			
51	Loop Load. Coil		1Ω			
52	Wave Trap		42Ω			
53	Osc. Coil		5Ω		14-1040	
54	Input IF	17Ω	16Ω		16-6658	
55	Output IF	16Ω	22Ω		16-6660	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					AUTOMATIC PART No.		
56	Screw	120V	.05A				Type C7
57	"	"	"				"

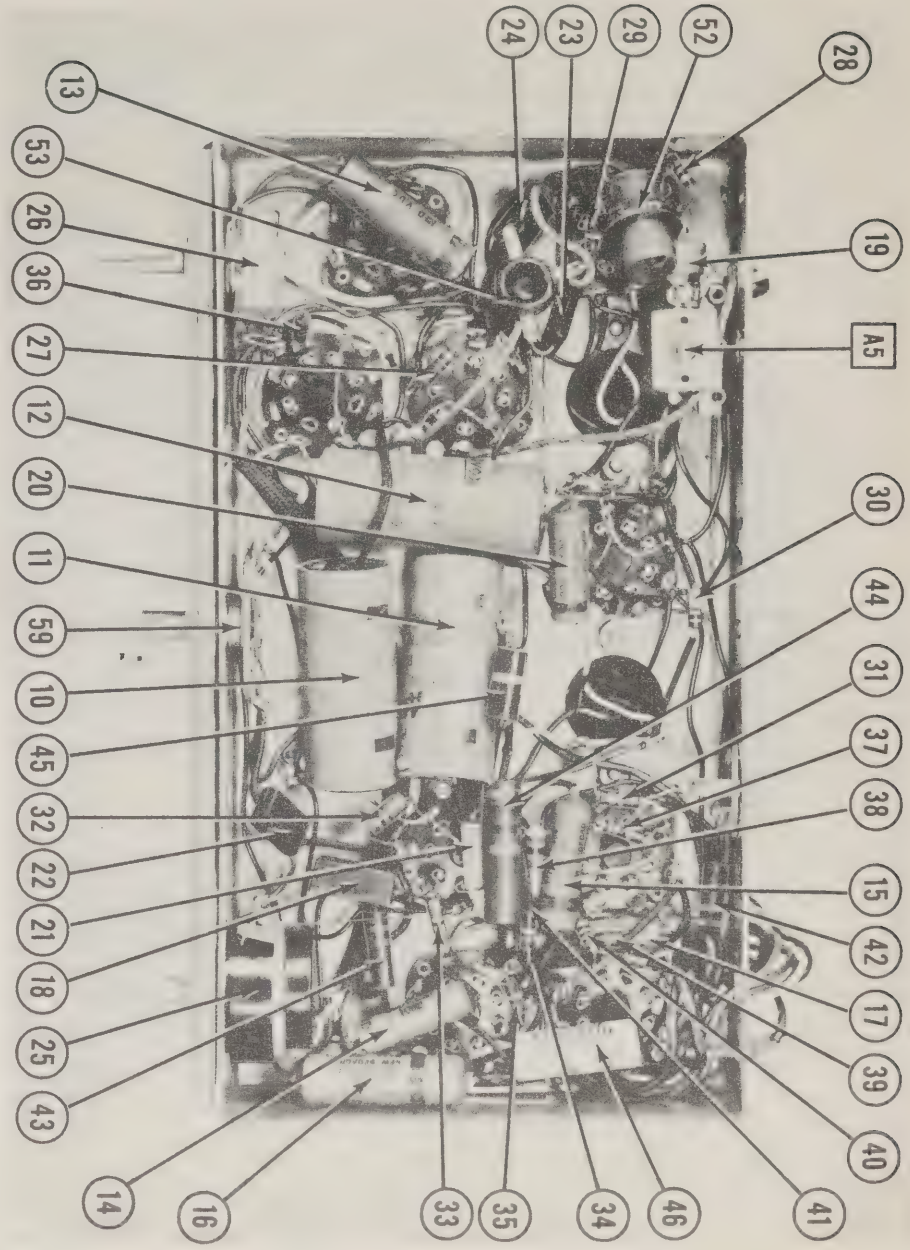
PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA		REMARKS
	AUTOMATIC PART No.	ASTATIC PART No.	
58		L-70	

MISCELLANEOUS

ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
59	Switch		Radio-Phono
60	2 Gang Var. Cap.		17-380MMF, 32-194 MMF

CHASSIS—BOTTOM VIEW



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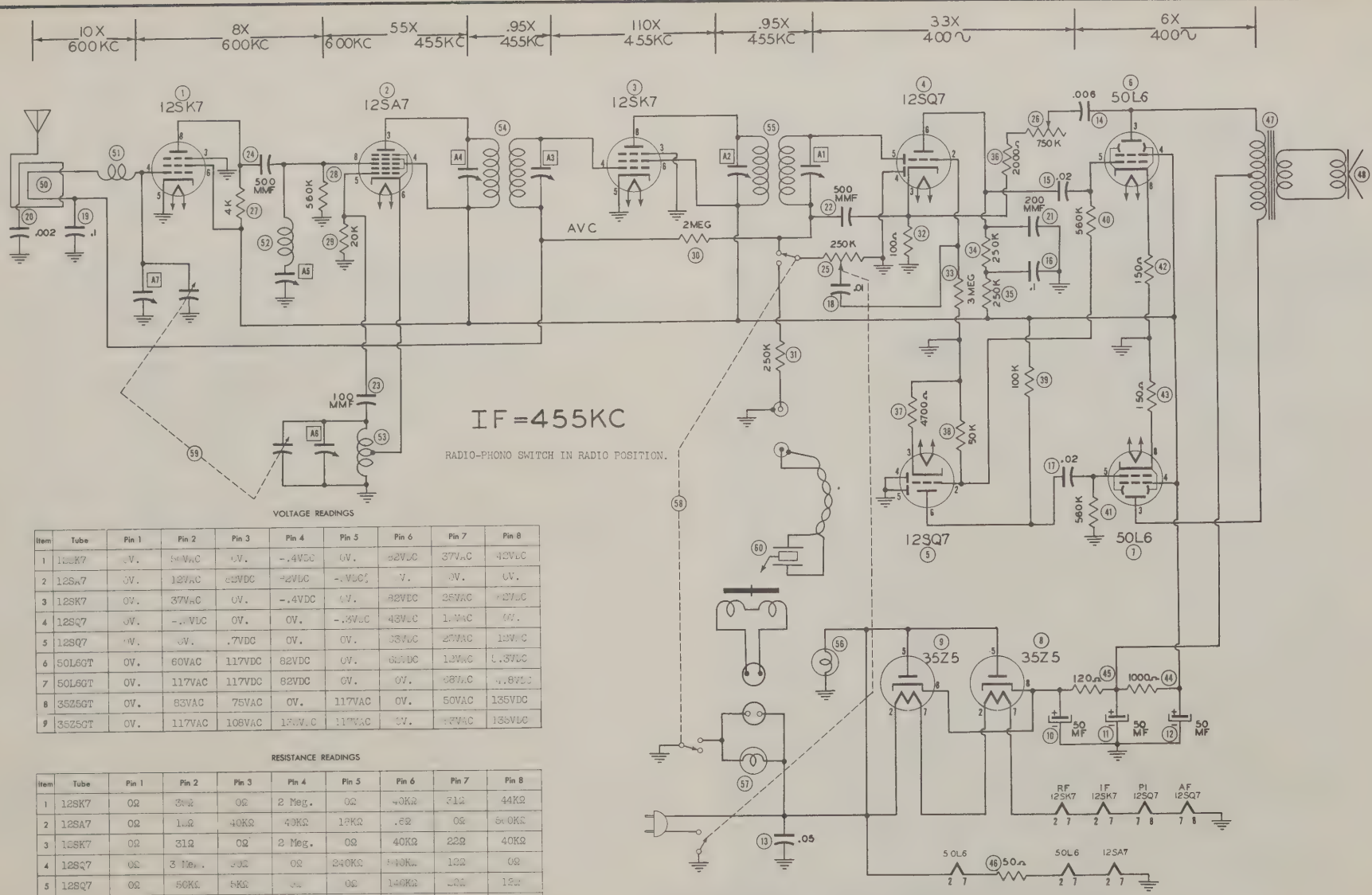
AUTOMATIC MODEL F-750

AUTOMATIC MODEL F-750



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SK7	0V.	80VAC	0V.	-.4VDC	0V.	82VDC	37VAC	42VDC
2	12SA7	0V.	12VAC	82VDC	42VDC	-.4VDC	0V.	0V.	0V.
3	12SK7	0V.	37VAC	0V.	-.4VDC	0V.	82VDC	25VAC	42VDC
4	12SQ7	0V.	-.4VDC	0V.	0V.	-.4VDC	43VDC	1.4VAC	0V.
5	12SQ7	0V.	0V.	.7VDC	0V.	0V.	83VDC	25VAC	125VDC
6	50L6GT	0V.	60VAC	117VDC	82VDC	0V.	82VDC	12VAC	0.8VDC
7	50L6GT	0V.	117VAC	117VDC	82VDC	0V.	0V.	68VAC	0.8VDC
8	35Z5GT	0V.	83VAC	75VAC	0V.	117VAC	0V.	50VAC	135VDC
9	35Z5GT	0V.	117VAC	108VAC	125VAC	117VAC	0V.	83VAC	135VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SK7	0Ω	300Ω	0Ω	2 Meg.	0Ω	40KΩ	31Ω	44KΩ
2	12SA7	0Ω	1KΩ	40KΩ	40KΩ	12KΩ	.6Ω	0Ω	50KΩ
3	12SK7	0Ω	31Ω	0Ω	2 Meg.	0Ω	40KΩ	22Ω	40KΩ
4	12SQ7	0Ω	3 Meg.	50Ω	0Ω	240KΩ	240KΩ	12Ω	0Ω
5	12SQ7	0Ω	50KΩ	5KΩ	0Ω	0Ω	140KΩ	20Ω	12Ω
6	50L6GT	2.1KΩ	46Ω	40KΩ	40KΩ	630KΩ	240KΩ	12Ω	150Ω
7	50L6GT	0Ω	54Ω	40KΩ	40KΩ	600KΩ	INF	60Ω	150Ω
8	35Z5GT	0Ω	51Ω	50Ω	INF	54Ω	INF	3.2	44K
9	35Z5GT	0Ω	54Ω	53Ω	40KΩ	54Ω	0Ω	1Ω	44K

$TAKEN WITH VACUUM-TUBE VOLTMETER.

A PHOTOFACT STANDARD NOTATION SCHEMATIC.

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RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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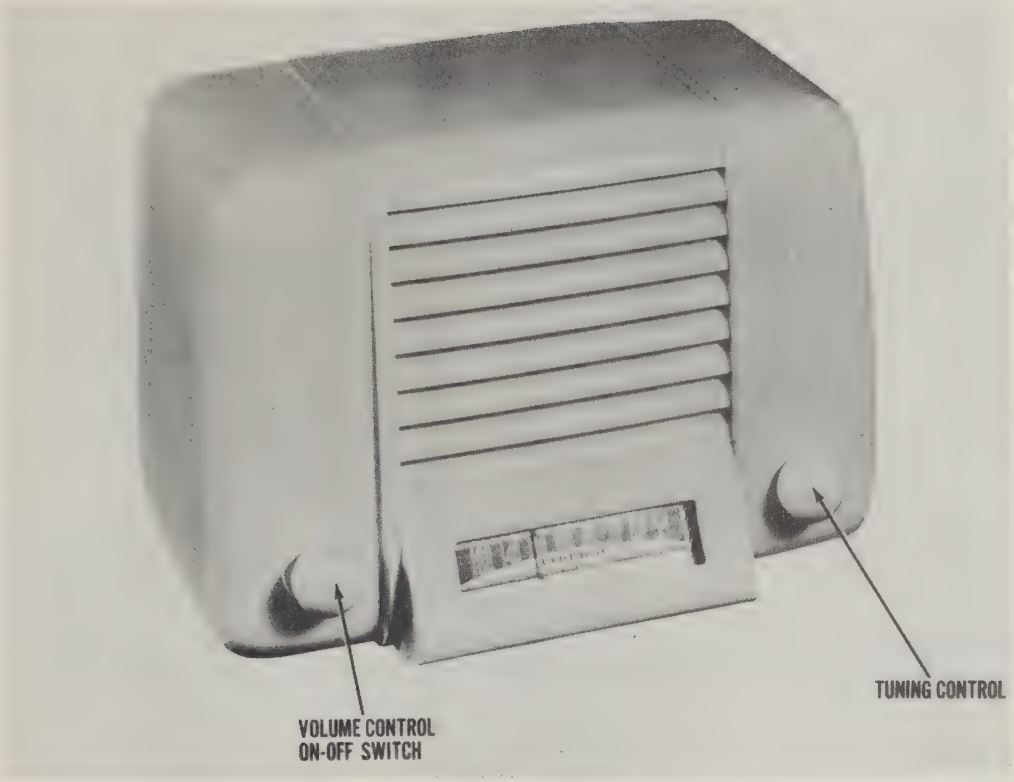
4713-5

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

CLARION
MODEL 11801



CLARION
MODEL 11801

CLARION MODEL 11801

TRADE NAME	Clarion, Model 11801
MANUFACTURER	Warwick Mfg. Corp., 4640 W. Harrison St., Chicago 44, Ill.
TYPE SET	AC-DC Superheterodyne Receiver with Loop Ant.
TUBES (FIVE)	Types, 12SA7 Converter, 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY RATING	110-120 Volts AC-DC .260 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1630KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial. Use isolation transformer if available. If not connect a .1 MFD. capacitor in series with low side of signal generator and chassis. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to stator of front section of tuning cap. Low side to chassis.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used, reduce dummy ant. to .001 MFD. to reduce hum modulation.
2	250 MMF.	"	1600KC	1600KC	"	A5	Adjust for maximum output.
3	250 MMF.	High side to ext. ant. Low side to chassis.	1400KC	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

CLARION MODEL 11801

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CLARION PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7	12SA7	8R	
2	IF Amp.	12SK7GT	12SK7GT	8N	
3	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CLARION PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	30	150	B18-283	BRD3315	TCD47	M-2x30-150	TA-330	PRS150-40-40	Filter - Red
B	30	150							Filter - Yellow
7	.05	400	A16-158	DT4S5	TP426	MPW-4-05	TC-15	484-05	Line Bypass
8	.01	400	A16-156	DT4S1	TP421	S-4-01	TC-11	484-01	Output Plate Bypass
9	.01	400	A16-156	DT4S1	TP421	S-4-01	TC-11	484-01	Audio Coupling " "
10	.005	600	A16-153	DT6D5	TP408	S-6-005	TC-25	684-005	
11	.05	200	A16-152	DT4S5	TP426	S-4-05	TC-15	484-05	RF Bypass Pwr. Supp.
12	.05	200	A16-152	DT4S5	TP426	S-4-05	TC-15	484-05	AVC Filter
13	.01	400	A16-156	DT4S1	TP421	S-4-01	TC-11	484-01	Ext. Ant. Isolation
14	250	500	A-15-176	5R5T25	MCB240	MOS.5-325	MS-325	1469-00025	AF Plate Bypass
15	250	500	A-15-176	5R5T25	MCB240	MOS.5-325	MS-325	1469-00025	RF Bypass VC
16	50	500	A-15-176	5W5Q5	MC225	MO.5-45	1FM-45	1468-00005	Osc. Grid Capacitor

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CLARION PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
17A	500KΩ	1	A24-161	MK-401	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req. " "	Not Req.	E	KSS-3	Attach to 17A per instructions " " " " "
C	Switch			M-26	41	SW-A	

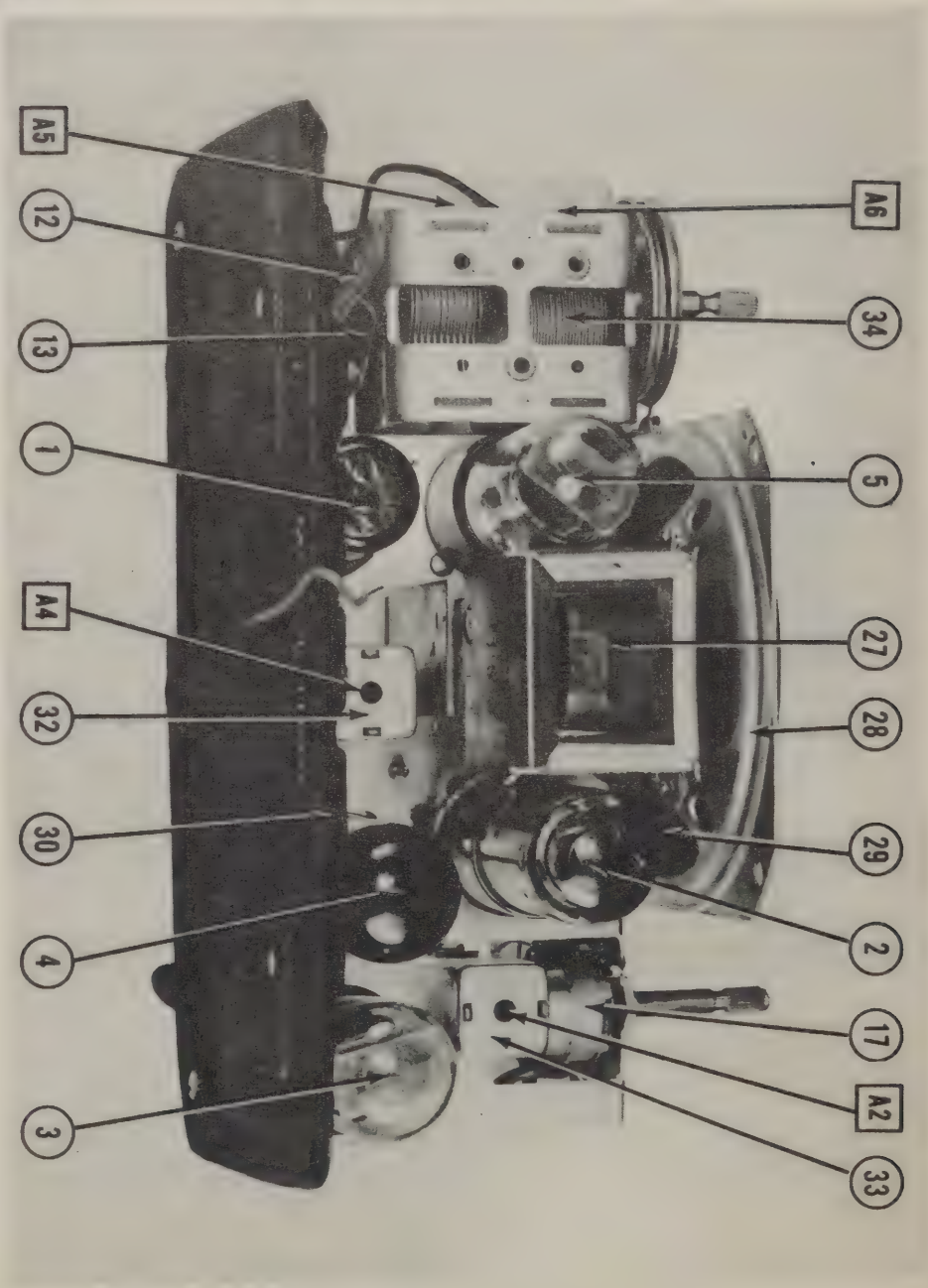
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CLARION PART No.	IRC PART No.	IDENTIFICATION CODES
18	22KΩ	½	A60-659	BTS-22K	Red-Red-Or. Oscillator Grid
19	2.2 Meg.	½	A60-684	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
20	10 Meg.	½	A60-663	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
21	220KΩ	½	A60-667	BTS-220K	Red-Red-Yl. AF Plate Load
22	470KΩ	½	A60-662	BTS-470K	Yl.-Vi.-Yl. Output Grid
23	120Ω	½	A60-702	BW-½-120	Br.-Red-Br. Output Cathode
24	10KΩ	1	A60-698	BTA-10K	Br.-Blk.-Or. Bias Network
25	1000Ω	2	A60-732	BTA-1000	Br.-Blk.-Red Filter
26	27Ω	½	A60-690	BW-½-27	Red-Vi.-Blk. Rectifier Ballast

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: CLARION PART No.	STANCOR PART No.	THORDARSON PART No.		INSTALLATION NOTES
27	4500Ω	3.4Ω	240Ω	.4Ω	A80-223	A-3877*	T22S46*		*Bend mounting tabs down, file out slots and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

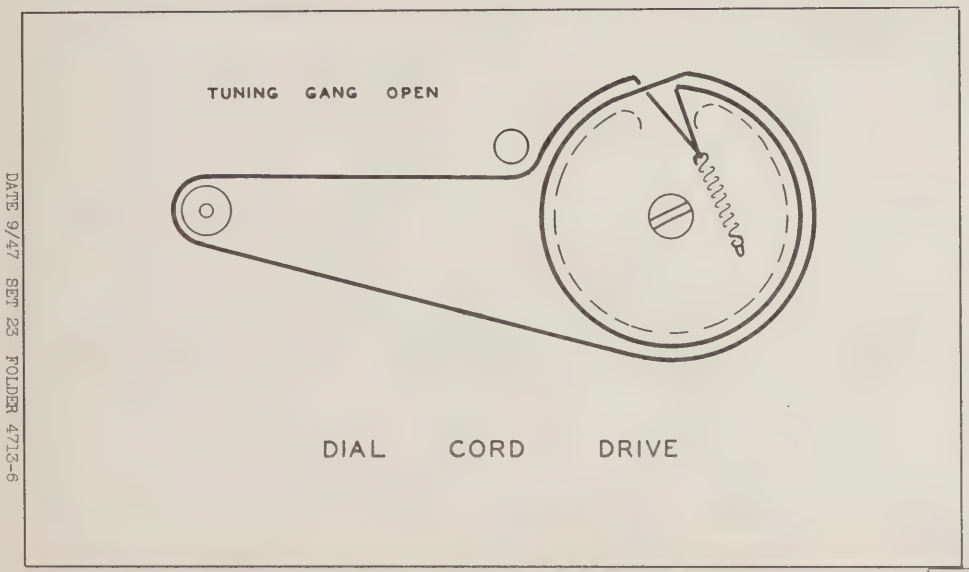
ITEM No.	RATINGS		REPLACEMENT DATA: CLARION PART No.	REPLACEMENT DATA: JENSEN PART No.		INSTALLATION NOTES
28	FIELD PM	VC IMP. 3.4Ω	79-316	ST-113† Mod. P4-X		†Fabricate new mounting bracket.
29	CONE DIA. 4"	VC DIA. 1/2"	NOT READILY REPLACEABLE - USE COMPLETE SPEAKER UNIT			

R F COILS

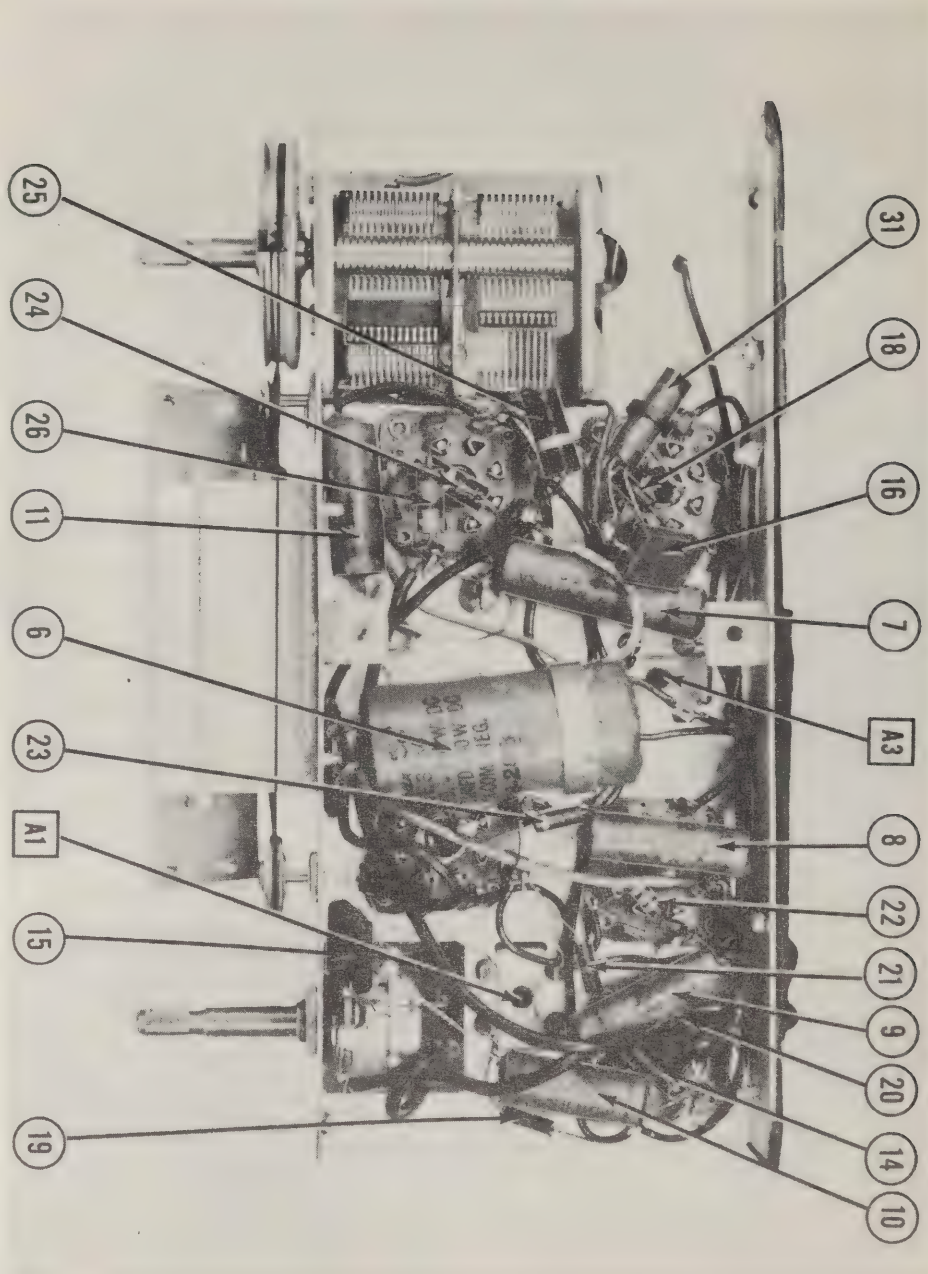
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: CLARION PART No.	REPLACEMENT DATA: MEISSNER PART No.	
30	Loop Ant.	.1Ω	.8Ω	B82-46		
31	Osc. Coil		5Ω	B10-480		
32	Input IF	19Ω	28Ω	A-10-478		
33	Output IF	21Ω	21Ω	A-10-479		

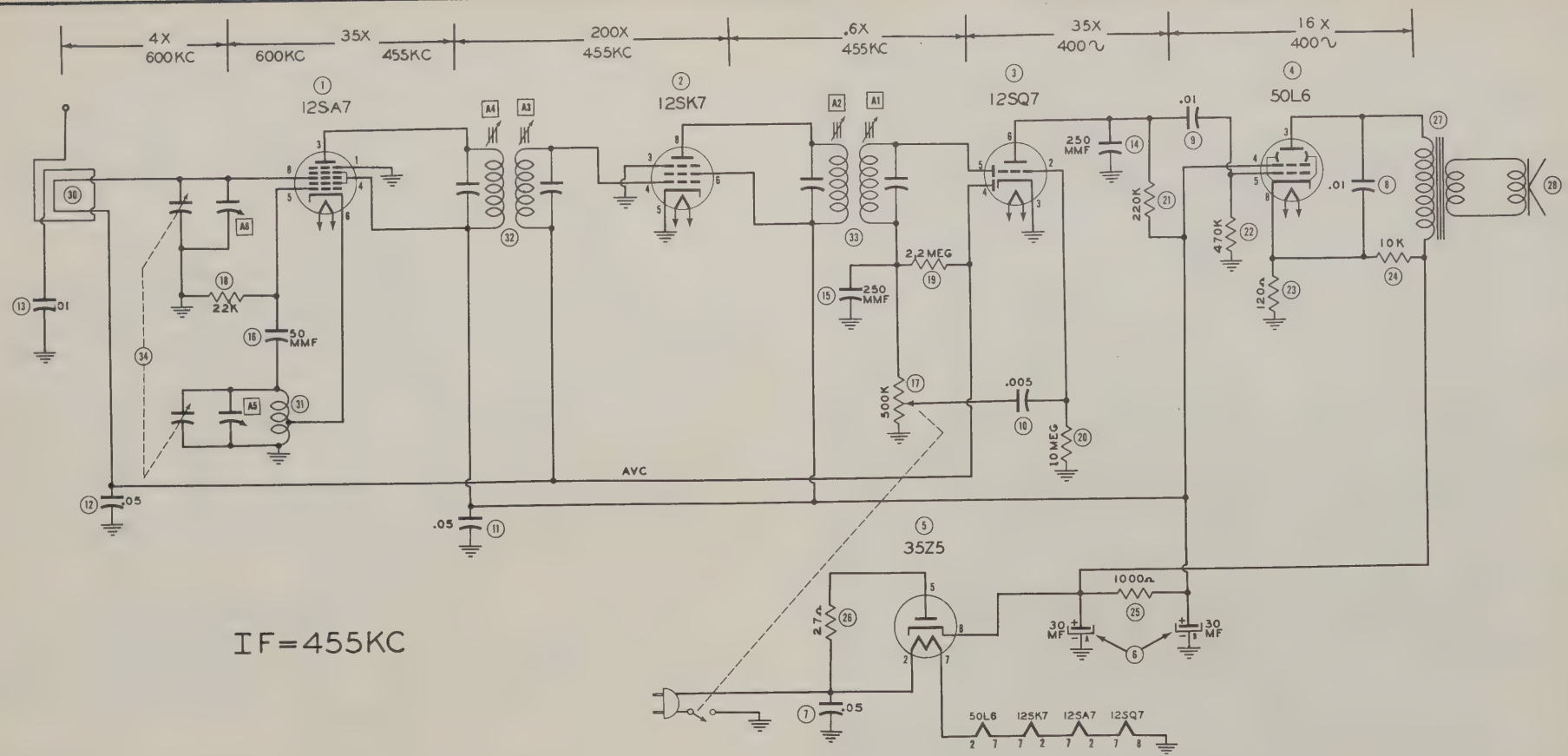
MISCELLANEOUS

ITEM No.	PART NAME	CLARION PART No.	NOTES
34	Tuning Capacitor	19-173	(45-212 MMF, 23-395MMF)
	Dial Crystal	48-34	
	Dial Pointer	58-37	
	Cabinet Back	C83-448	
	Cabinet	42-320W	Molded Walnut
	"	A42-420	Molded Ivory
	Dial Scale	67-462	
	Knob	52-165W	Walnut
	"	A52-222	Ivory



CHASSIS—BOTTOM VIEW





IF=455KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	0Ω	12Ω	11KΩ	11KΩ	25KΩ	.5Ω	24Ω	3 Meg.
2	12SK7GT	0Ω	24Ω	0Ω	3 Meg.	0Ω	11KΩ	36Ω	11KΩ
3	12SQ7GT	0Ω	10 Meg.	0Ω	3 Meg.	500KΩ	230KΩ	12Ω	0Ω
4	50L6GT	0Ω	82Ω	10KΩ	11KΩ	460KΩ	INF	36Ω	112Ω
5	35Z5GT	0Ω	111Ω	103Ω	112Ω	140Ω	11KΩ	82Ω	10KΩ

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	0V.	12VAC	90VDC	90VDC	-7.2VDC§	0V.	24VAC	-.5VDC
2	12SK7GT	0V.	24VAC	0V.	-.6VDC	0V.	90VDC	37VAC	90VDC
3	12SQ7GT	0V.	-.55VDC	0V.	-.55VDC	-.5VDC	60VDC	12VAC	0V.
4	50L6GT	0V.	85VAC	106VDC	90VDC	0V.	0V.	37VAC	5.7VDC
5	35Z5GT	0V.	117VAC	110VAC	5.7VDC	115VAC	90VDC	85VAC	117VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

4713-6

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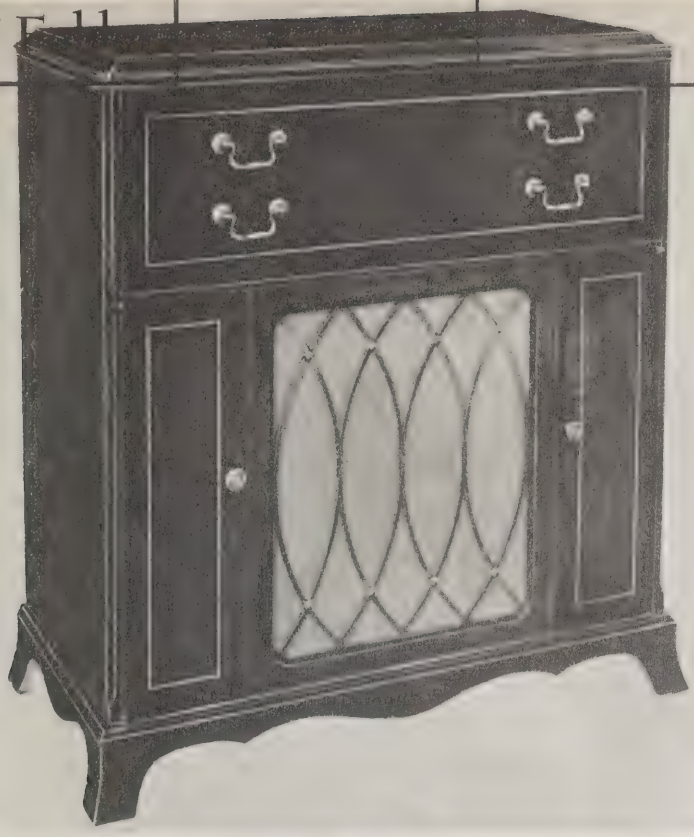
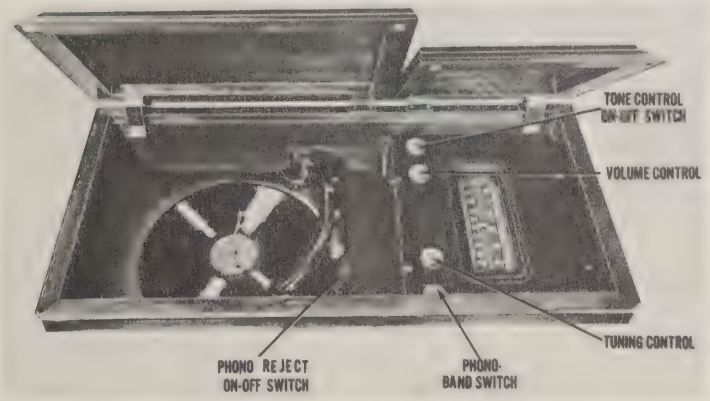
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.





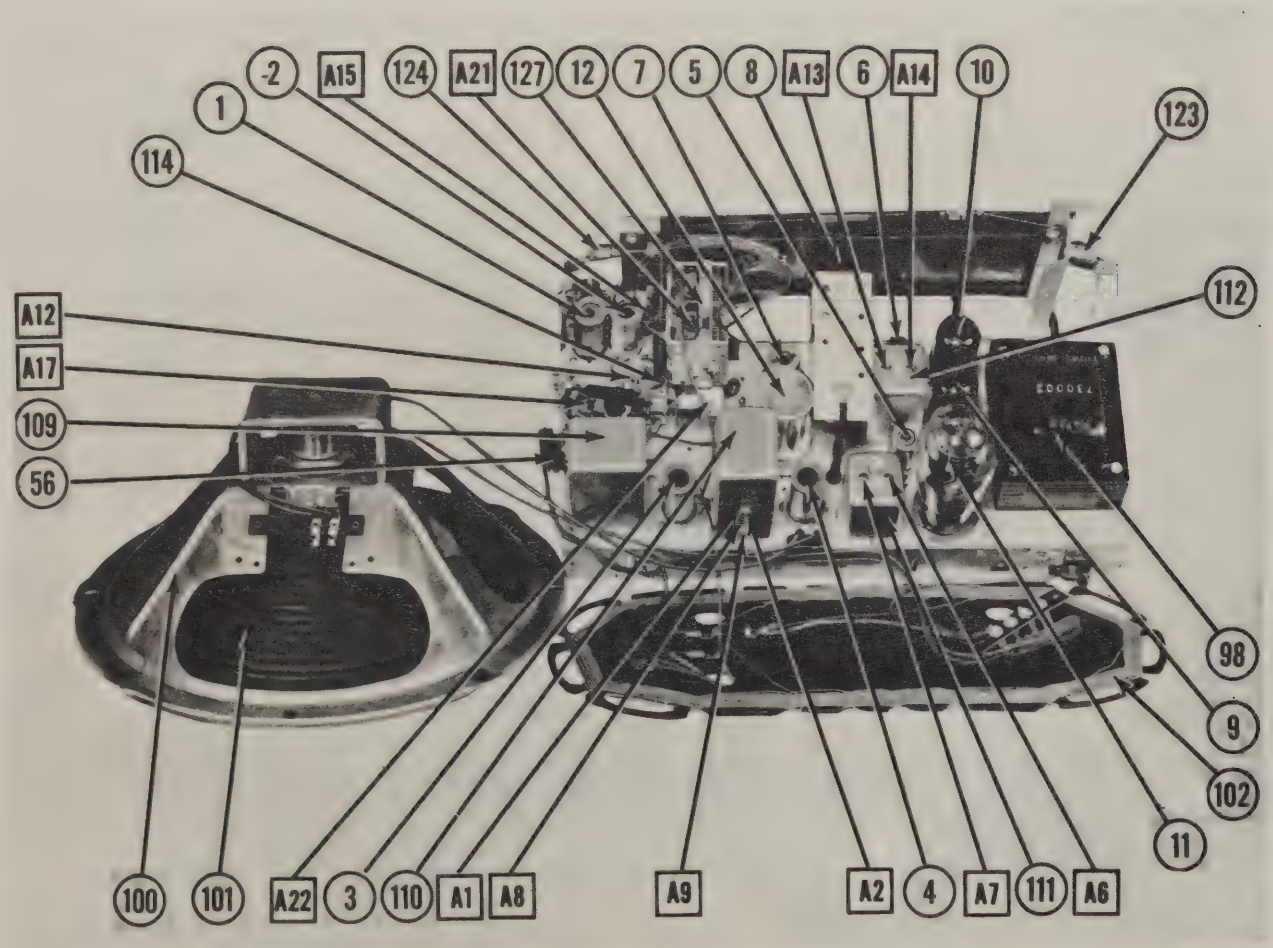
EMERSON MODEL 537

TRADE NAME	Emerson, Model 537 (Chassis No. 120043)
MANUFACTURER	Emerson Radio & Phono Corp., 111 8th Ave., New York, N.Y.
TYPE SET	AC Operated Phono-Radio Combination FM-AM Superheterodyne Receiver with Self Contained Loop Antenna.
TUBES (ELEVEN)	Types, 6AG5 RF Amp., 6BE6 Converter, 6BA6 1st IF Amp., 6BA6 2nd IF Amp., 6AU6 Limiter & AM 2nd Det., 6AL5 FM Ratio Det., 6AU6 Audio Amp., 6U5/6G5 Tuning Eye, (2) 6V6GT Power Output, 5U4G Rectifier.
POWER SUPPLY	110-120 Volts AC
RATING	1.0 Amp. @ 117V. AC
TUNING RANGE-BROADCAST	535-1620KC FM 87.5-108.5MC

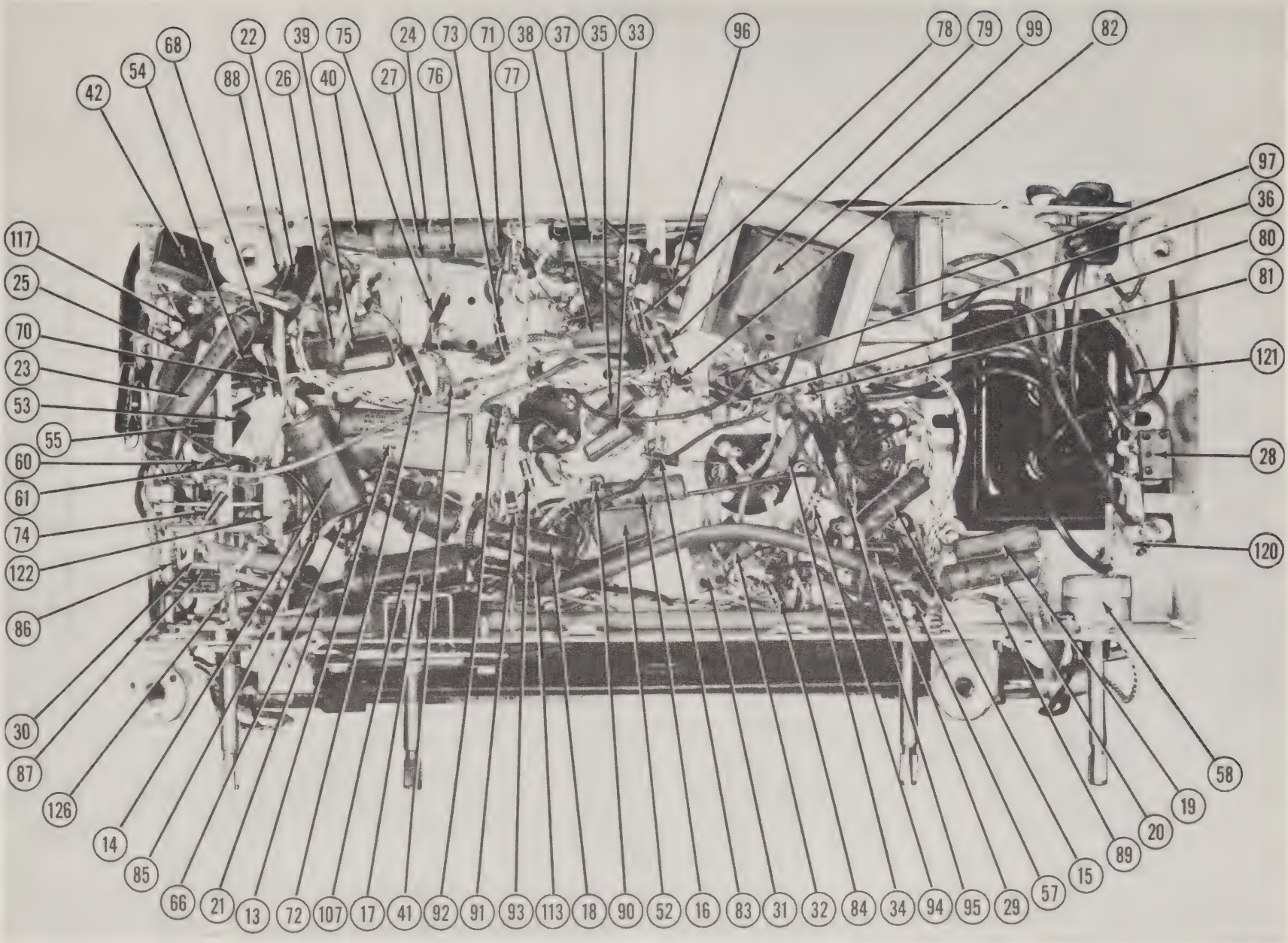
HOWARD W. SAMS & CO., INC. • 2924 East Washington Street • Indianapolis 6, Indiana

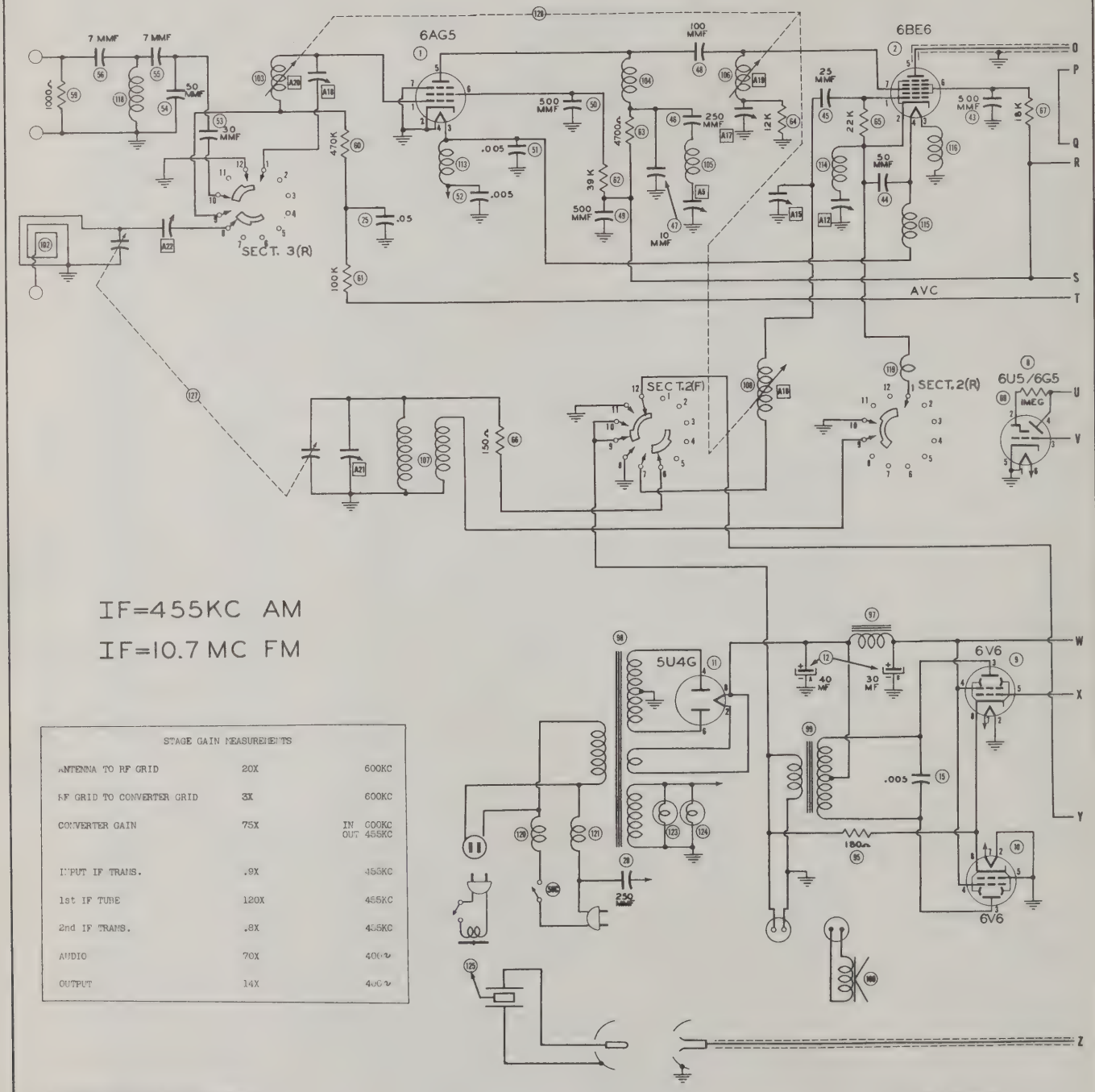
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1947 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW





STAGE GAIN MEASUREMENTS		
ANTENNA TO RF GRID	20X	600KC
RF GRID TO CONVERTER GRID	3X	600KC
CONVERTER GAIN	75X	IN 600KC OUT 455KC
INPUT IF TRANS.	.9X	455KC
1st IF TUBE	120X	455KC
2nd IF TRANS.	.8X	455KC
AUDIO	70X	400~
OUTPUT	14X	400~

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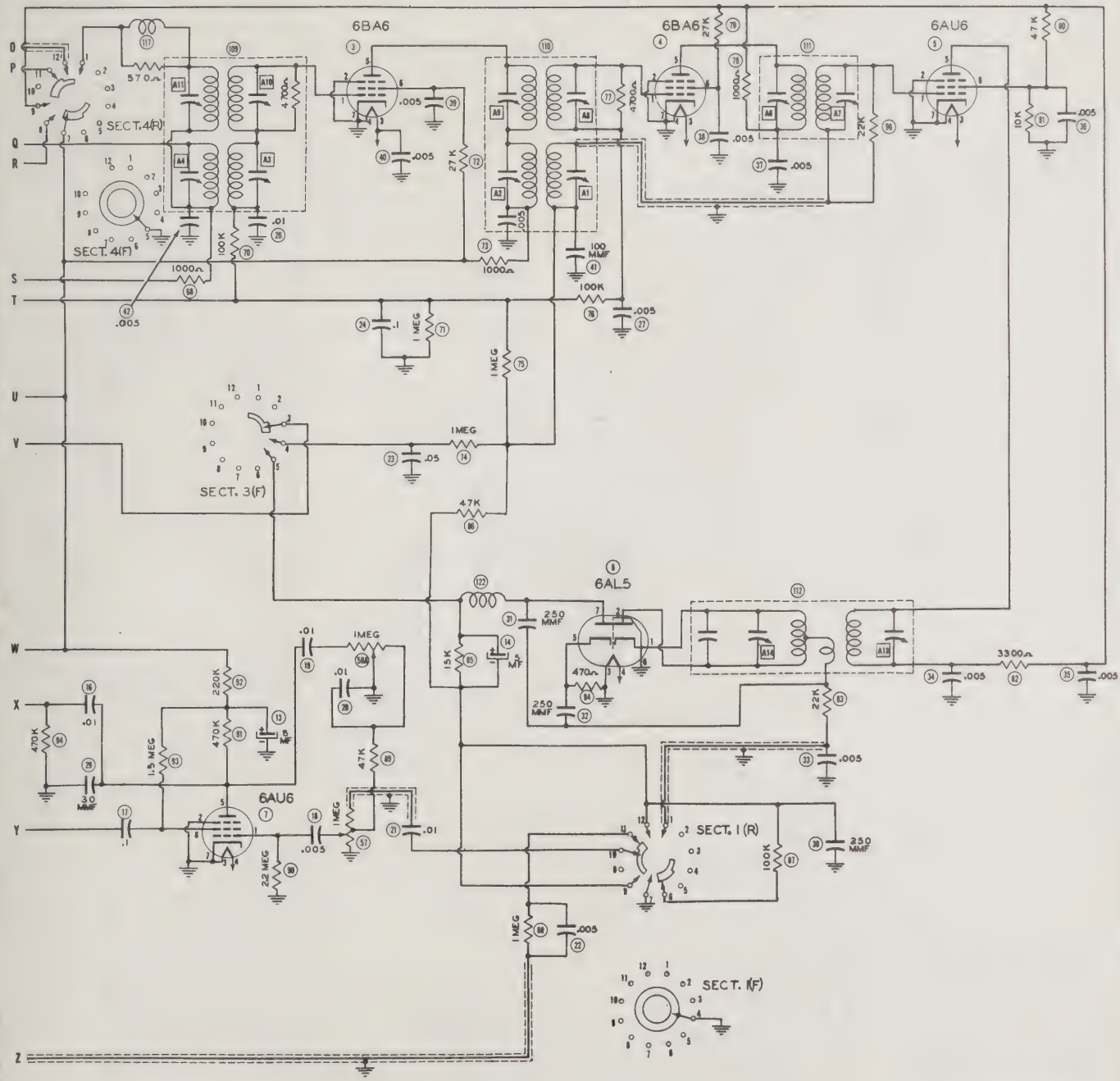
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.



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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	EIA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	6AG5	6AG5	7BD	
2	Converter	6BE6	6BE6	7CH	
3	1st IF Amp.	6BA6	6BA6	7BK	
4	2nd IF Amp.	6BA6	6BA6	7BK	
5	Lim. - AM 2nd Det.	6AU6	6AU6	7BK	
6	FM Ratio Det.	6AL5	6AL5	6BT	
7	Audio Amp.	6AU6	6AU6	7BK	
8	Tuning Eye	6U5/6G5	6U5/6G5	6R	
9	Power Output	6V6GT	6V6GT	7AC	
10	Power Output	6V6GT	6V6GT	7AC	
11	Rectifier	5U4G	5U4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
12A	40	400	925006	UP9BJ39	FP238	DY-4x20-450*	EL-240	AF4444J*	Filter
B	30	400							"
13	8	450	925190	BR845	TC71	M-8-450	UT-8	PRS450-8	AF Plate Decoupling
14	5	50	925005	BR550	TC40	M-4-150	TA-55	PRS150-4	Ratio Det. Bias
15	.005	400	920180	DT6D5	TP408	S-6-005	TC-25	484-005	Tone Compensation
16	.01	400	920090	DT4S1	TP421	S-4-01	TC-11	484-01	Audio Coupling
17	.1	400	920250	DT4P1	TP428	S-4-.1	TC-1	484-.1	Feedback Coupling
18	.005	400	920180	DT6D5	TP408	S-6-005	TC-25	484-005	Audio Coupling
19	.01	400	920090	DT4S1	TP421	S-4-01	TC-11	484-01	Tone Compensation
20	.01	400	920090	DT4S1	TP421	S-4-01	TC-11	484-01	" "
21	.01	400	920090	DT4S1	TP421	S-4-01	TC-11	484-01	Audio Coupling
22	.005	400	920180	DT6D5	TP408	S-6-005	TC-25	484-005	Phono Coupling
23	.05	200	920060	DT4S5	TP426	S-4-05	TC-15	484-05	AM Eye Grid Filter
24	.1	200	920040	DT4P1	TP428	S-4-1	TC-1	484-.1	AVC Filter
25	.05	200	920060	DT4S5	TP426	S-4-05	TC-15	484-05	" "
26	.01	400	920090	DT4S1	TP421	S-4-01	TC-11	484-01	" "
27	.005	600	910356	DT6D5	TP408	S-6-005	TC-25	484-005	" "
28	250	500	910320	5W5T25	MC240	MO.5-325	1FM-325	1468-00025	FM Antenna Coupling
29	30		928107						AF Plate Bypass
30	250	500	910320	5W5T25	MC240	MO.5-325	1FM-325	1468-00025	Diode Filter
31	250	500	910320	5W5T25	MC240	MO.5-325	1FM-325	1468-00025	Ratio Det. Load
32	250	500	910320	5W5T25	MC240	MO.5-325	1FM-325	1468-00025	" " "
33	5000	300	910356	1W5D5	MC255	MW.5-25			De-emphasis
34	5000	300	910356	1W5D5	MC255	MW.5-25			Limiter Plate Decoup.
35	5000	300	910356	1W5D5	MC255	MW.5-25			RF Bypass Pwr. Supply
36	5000	300	910356	1W5D5	MC255	MW.5-25			Limiter Screen Bypass
37	5000	300	910356	1W5D5	MC255	MW.5-25			2nd IF Decoupling
38	5000	300	910356	1W5D5	MC255	MW.5-25			2nd IF Screen Bypass
39	5000	300	910356	1W5D5	MC255	MW.5-25			1st IF Screen Bypass
40	5000	300	910356	1W5D5	MC255	MW.5-25			1st IF Fil. Bypass
41	100	500	910100	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Diode Filter
42	5000	300	910356	1W5D5	MC255	MW.5-25			Conv. Plate Decoup.
43	500		915003						Conv. Screen Bypass
44	50		928102	5W5Q5	MC225	MO.5-45	1FM-45	1468-00005	Conv. Cathode Bypass
45	25		928101						Osc. Grid Cap.
46	250	500	910320	5W5T25	MC240	MO.5-325	1FM-325	1468-00025	Wave Trap
47	10		928002						RF Plate Decoup.
48	100		928106	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	RF Coupling
49	500		915003						" Decoupling
40	500		915003						RF Screen Bypass
51	5000	300	910356	1W5D5	MC255	MW.5-25			RF Fil. Bypass
52	5000	300	910356	1W5D5	MC255	MW.5-25			RF Fil. Decoup.
53	30		928107						FM RF Coupling
54	50		928102	5W5Q5	MC225	MO.5-45	1FM-45	1468-00005	Fixed Trimmer
55	7		928105						FM RF Coupling
56	7		928105						" " "

*Parallel two sections to obtain desired capacity.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDAR'N PART No.	REPLACEMENT DATA:	INSTALLATION NOTES
99A	13000 Ω CT	3.1Ω	320Ω CT	.3Ω	734005	A-3850#	T22856#		#Drill one new mounting hole.
B					734004				Alternate Transformer.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA:	INSTALLATION NOTES
100	FIELD PM	VC IMP. 3.1Ω	180023	ST-102** Mod. P12S		**Replace output transformer to match 8Ω voice coil.
101	CONE DIA. 12"	VC DIA. 11"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: MEISSNER PART No.	
102	Loop Ant.	.5Ω	1Ω	700003		
103	FM Ant.Coil		0Ω	710014		
104	RF Plate Choke	1.2Ω		705000		
105	AM Wave Trap		63Ω	708001		
106	FM RF Coil		0Ω	713003		
107	AM Osc.Coil	.5Ω	5.5Ω	716113		
108	FM Osc.Coil		0Ω	716112		
109	1st AM FM IF	11Ω.1Ω	12Ω§	720015		§ Includes both secondary windings.
110	2nd AM FM IF	12.5Ω§§	11Ω .5Ω	720016		§§Includes both primary windings.
111	3rd FM IF	1Ω	1Ω	720014		
112	Ratio Det. Trans.	1.2Ω	.2Ω	708145		
113	RF Choke	.2Ω		705002		
114	" "	.2Ω		705002		
115	" "	.2Ω		705002		
116	RF Choke	.2Ω		705002		
117	" "	1Ω		705005		
118	" "	0Ω		705003		
119	" "	.1Ω		705007		
120	" "	.2Ω		705002		
121	" "	.2Ω		705002		
122	" "	1.2Ω		705000		

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA:	INSTALLATION NOTES
123	Bayonet	6-8	0.25	Blue	807020		Type 44
124	"	"	"	"	807020		" "

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: ASTATIC PART No.	REMARKS
125		Nylon 1J	

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
57A	1 Meg.	1	390004	TM338	D13-137X	AT-109	Volume Control
B	Shaft		Not Req.	SS25	E	KSS-3	Attach to 57A per instructions
58A	1 Meg.	1	390081	UM160			Tone Control
B	Shaft		Not Req.	SS25			Attach to 58A per instructions
C	Switch		" "	M26			" " " " "

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	EMERSON PART No.	IRC PART No.	
59	1000Ω	½	320490	BTS-1000	Br.-Blk.-Red FM Antenna Loading
60	470KΩ	½	321130	BTS-470K	Yl.-Vi.-Yl. RF Grid
61	100KΩ	½	320970	BTS-100K	Br.-Blk.-Yl. AVC Network
62	39KΩ	1	370872	BTA-39K	Or.-White-Or. RF Screen Dropping
63	4700Ω	½	310650	BTS-4700	Yl.-Vi.-Red RF Plate Decoupling
64	12KΩ	½	310750	BTS-12K	Br.-Red-Or. Converter Grid
65	22KΩ	½	310810	BTS-22K	Red-Red-Or. Oscillator Grid
66	150Ω	½	320290	BW-½-150	Br.-Grn.-Br. Parasitic Suppressor
67	18KΩ	2	397070	BT-2-18K	Br.-Gray-Or. Converter Screen Dropping
68	1000Ω	½	320490	BTS-1000	Br.-Blk.-Red Converter Plate Decoupling
69	1 Meg.	½	321210	BTS-1 Meg.	Br.-Blk.-Grn. Tuning Eye Plate Load
70	100KΩ	½	320970	BTS-100K	Br.-Blk.-Yl. AVC Network
71	1 Meg.	½	311210	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
72	27KΩ	1	370830	BTA-27K	Red-Vi.-Or. 1st IF Screen Dropping
73	1000Ω	½	320490	BTS-1000	Br.-Blk.-Red 1st IF Plate Decoupling
74	1 Meg.	½	321210	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
75	1 Meg.	½	321210	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
76	100KΩ	½	320970	BTS-100K	Br.-Blk.-Yl. AVC Network
77	4700Ω	½	310650	BTS-4700	Yl.-Vi.-Red 2nd FM-IF Transformer Shunt
78	1000Ω	½	320490	BTS-1000	Br.-Blk.-Red 2nd IF Plate Decoupling
79	27KΩ	1	370830	BTA-27K	Red-Vi.-Or. 2nd IF Screen Dropping
80	47KΩ	1	370890	BTA-47K	Yl.-Vi.-Or. Limiter Screen Dropping
81	10KΩ	1	370730	BTA-10K	Br.-Blk.-Or. Limiter Screen Bleeder
82	3300Ω	½		BTS-3300	Or.-Or.-Red Limiter Plate Decoupling-See Note
83	22KΩ	½	350810	BTS-22K	Red-Red-Or. De-emphasis
84	470Ω	½	340410	BTS-470	Yl.-Vi.-Br. Ratio Detector Bias
85	15KΩ	½	310771	BTS-15K	Br.-Grn.-Or. Ratio Detector Bias Network
86	47KΩ	½	310890	BTS-47K	Yl.-Vi.-Or. Diode Filter
87	100KΩ	½	320970	BTS-100K	Br.-Blk.-Yl. Diode Load
88	1 Meg.	½	321210	BTS-1 Meg.	Br.-Blk.-Grn. Series Phono
89	47KΩ	½	310890	BTS-47K	Yl.-Vi.-Or. Tone Compensation
90	2.2 Meg.	½	321290	BTS-2.2 Meg.	Red-Red-Grn.AF Grid
91	470KΩ	½	321130	BTS-470K	Yl.-Vi.-Yl. AF Plate Load
92	220KΩ	½	321050	BTS-220K	Red-Red-Yl. AF Plate Decoupling
93	1.5 Meg.	½	311250	BTS-1.5 Meg.	Br.-Grn.-Grn. AF Screen Dropping
94	470KΩ	½	321130	BTS-470K	Yl.-Vi.-Yl. Output Grid
95	180Ω	2	394140	BW-2-180	Br.-Gray-Br. Output Cathode
96	22KΩ	½	310810	BTS-22K	Red-Red-Or. 3rd IF Transformer Shunt

Note - Some models use 1000Ω in this application. Replacement same as #59.

FILTER CHOKE

ITEM NO.	RATINGS			REPLACEMENT DATA			INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000∼)	EMERSON PART NO.	STANCOR PART NO.	THORDARSON PART NO.	
97A	.063A	510Ω	11 Henries	737067			
B				737002			Alternate Choke.

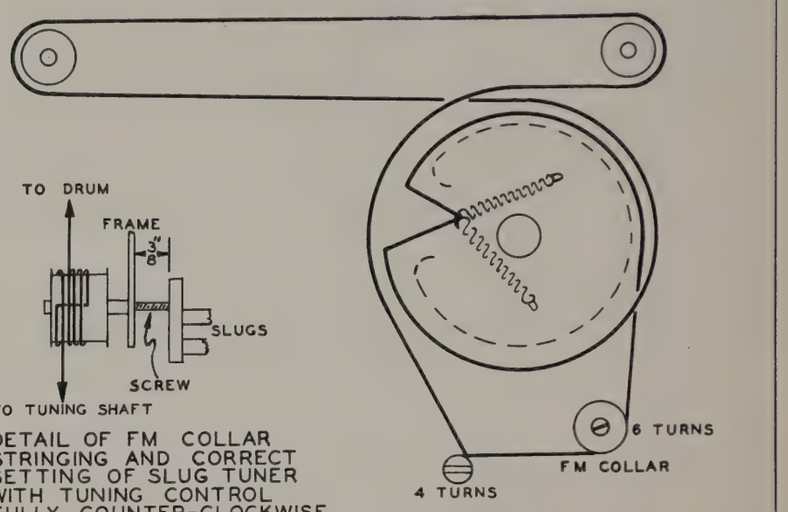
TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			INSTALLATION NOTES
	PRI.	SEC. 1	SEC. 2	SEC. 3	EMERSON PART No.	STANCOR PART No.	THORDARSON PART No.	
98	117V AC @ 1.0A	600V CT @ .14A	5.2V AC @ 3.0A	6.2V AC @ 3.6A	730002	P-6313†	T22R05 †	†Use universal mounting brackets.

PARTS LIST AND DESCRIPTIONS (Continued)

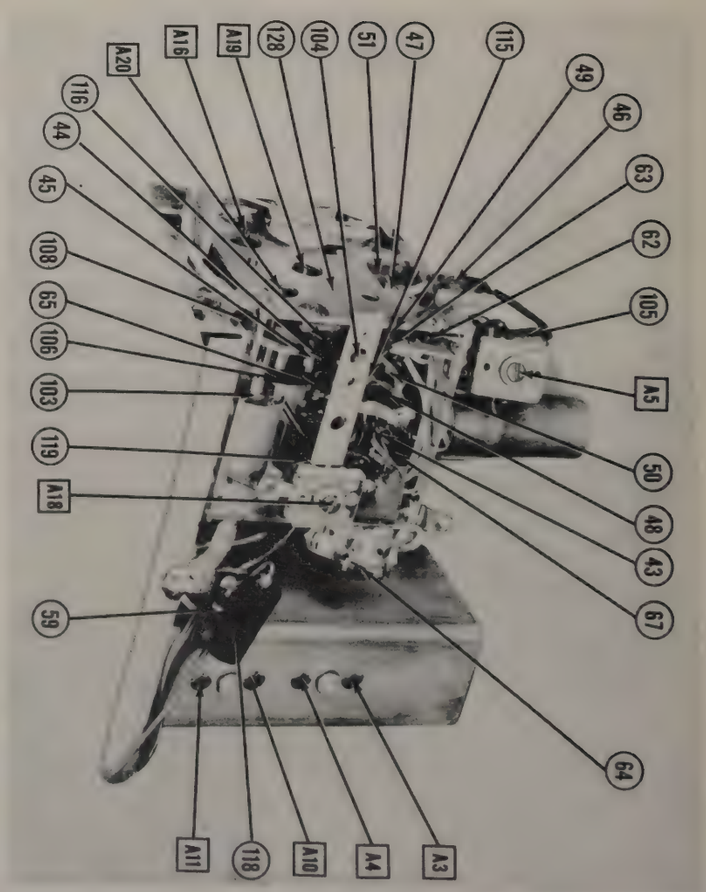
MISCELLANEOUS

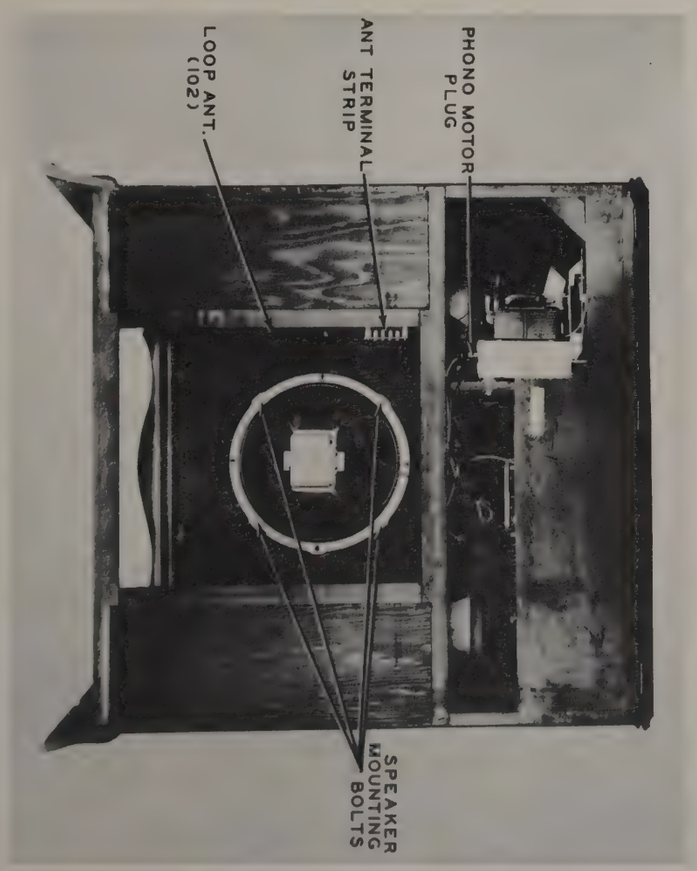
ITEM No.	PART NAME	EMERSON PART No.	NOTES
126	Switch		Band
127	Tuning Cap.	900007	
128	Tuning Assby.		FM
A12	Trimmer Cap.	900012	Regeneration Adj. (10-160 MMF)
A15	" "	900026	FM Osc. Adj. (1-8 MMF)
A17	" "	900314	FM RF Adj. (10-160 MMF)
A18	" "	900313	FM Ant. Adj. (1.6-18 MMF)
A22	" "	900318	BC Ant. Adj. (7-70 MMF)
	AC Plug	505005	Motor
	Connector Plug	505040	Pickup
	AC Receptacle	500500	
	Phono "	508010	
	Line Cord & Plug	583150	
	Terminal Strip	585004	Speaker
	Socket Assy.	507001	Pilot Light
	Tuning Ind.	585210	Socket & Cable
	Cabinet	140065	
	Knob	620034	Mahogany
	"	620035	" with Ind. Dot
	Drive Shaft	280002	Dial
	"	280505	FM Tuner
	Dial Backplate	520002	
	Dial Face	520003	



DETAIL OF FM COLLAR STRINGING AND CORRECT SETTING OF SLUG TUNER WITH TUNING CONTROL FULLY COUNTER-CLOCKWISE.

DIAL CORD DRIVE





DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs from top of cabinet.
2. Remove phono-motor plug from chassis.
3. Remove phono-pickup plug from chassis.
4. Remove two speaker plugs from chassis.
5. Remove two Phillips head screws holding ant. terminal strip to cabinet.
6. Remove two hex nuts and lock washers holding loop antenna to cabinet.
7. Remove two Phillips head bolts in phono compartment holding chassis to cabinet.
8. Remove two hex head bolts and lock washers holding chassis to cabinet. Remove loop and chassis from rear of cabinet.
9. Remove four hex head nuts holding speaker in cabinet. Remove speaker.

DATE 9/47 SET 2½ FOLDER 4713-7

*TAKEN IN FM POSITION.

VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6GA5	-.4VDC	0V.	6.2VAC	0V.	225VDC	137VDC	0V.	--
2	6BE6	-3VDC§	0V.	0V.	6.2VAC	270VDC	100VDC	0V.	--
3	6BA6	-.3VDC	0V.	6.2VAC	0V.	270VDC	122VDC	0V.	--
* 4	6BA6	-.5VDC	0V.	6.2VAC	0V.	260VDC	110VDC	0V.	--
* 5	6AU6	-.6VDC	0V.	6.2VAC	0V.	280VDC	48VDC	0V.	--
* 6	6AL5	0V.	0V.	0V.	6.2VAC	.4VDC	0V.	-11VDC	--
7	6AU6	-.7VDC	0V.	6.2VAC	0V.	59VDC	29VDC	0V.	--
8	6V6GT	0V.	0V.	320VDC	290VDC	0V.	59VDC	6.2VAC	15VDC
9	6V6GT	0V.	0V.	320VDC	290VDC	0V.	0V.	6.2VAC	15VDC
10	5U4G	0V.	330VDC	0V.	300VAC	0V.	300VAC	0V.	330VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6AG5	1.1 MEG.	0Ω	.2Ω	0Ω	85KΩ	120KΩ	0Ω	--
2	6BE6	22KΩ	.7Ω	.2Ω	.4Ω	80KΩ	98KΩ	12KΩ	--
3	6BA6	650KΩ	0Ω	.1Ω	0Ω	80KΩ	110KΩ	0Ω	--
* 4	6BA6	650KΩ	0Ω	.1Ω	0Ω	45KΩ	70KΩ	0Ω	--
* 5	6AU6	45K	0Ω	.1Ω	0Ω	45KΩ	10KΩ	0Ω	--
* 6	6AL5	INF.	INF.	0Ω	.1Ω	450Ω	0Ω	15KΩ	--
7	6AU6	2.4 MEG.	0Ω	.1Ω	0Ω	770KΩ	1.8 MEG.	0Ω	--
8	6V6GT	0Ω	0Ω	80KΩ	80KΩ	450KΩ	.3Ω	.1Ω	170Ω
9	6V6GT	0Ω	0Ω	80KΩ	80KΩ	0Ω	620KΩ	.1Ω	170Ω
10	5U4G	INF.	80KΩ	INF.	69Ω	INF.	72Ω	INF.	80K

§TAKEN WITH VACUUM-TUBE VOLTMETER.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

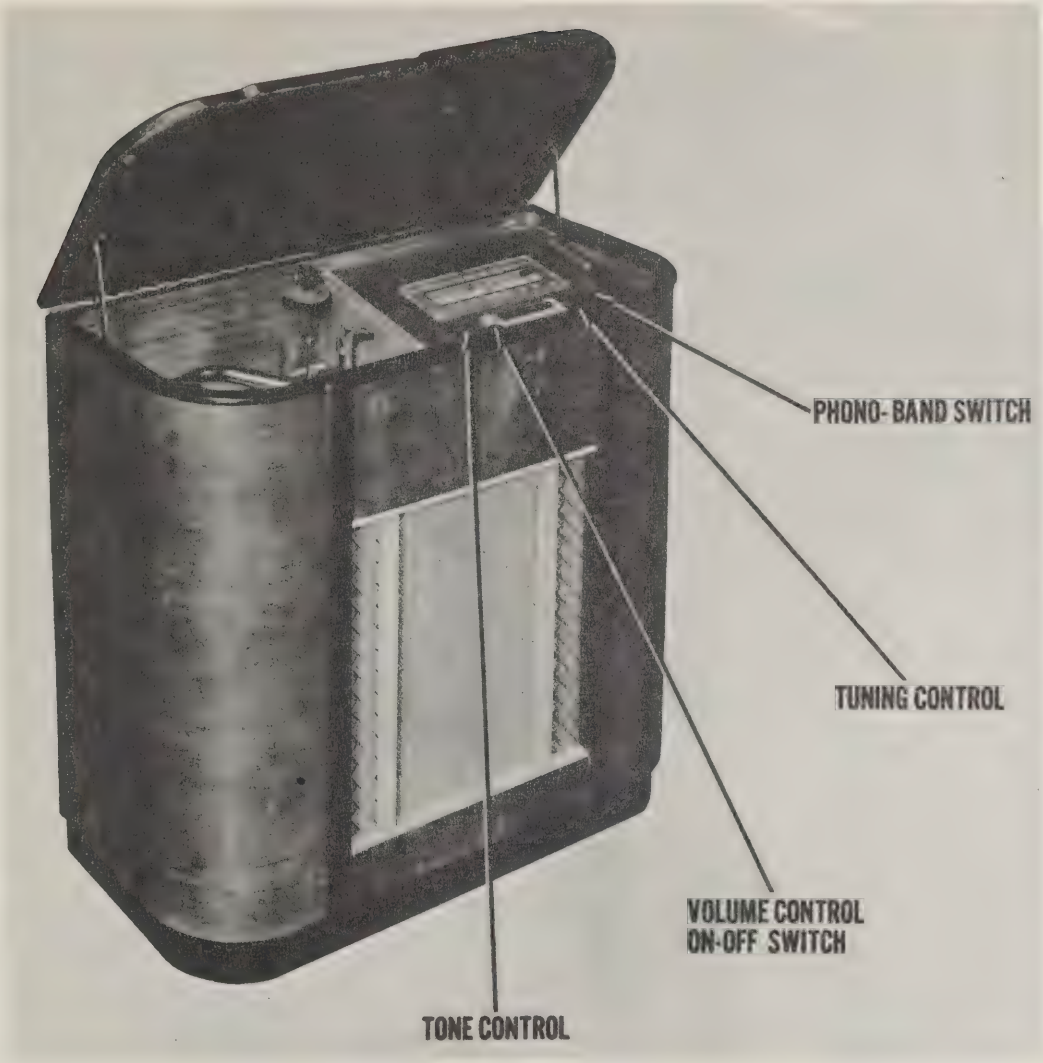
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial. To inject signal in Steps 5, 6 and 7 remove 6BE6 and connect wire to Pin 1. Replace tube making certain that wire does not short to shield base. In Step 9 connect two 100KΩ resistors in series from Pin 7 of 6AL5 to chassis. These resistors should be equal within 5%. After Step 9 turn tuning control fully counter-clockwise and check adjustment of FM Tuning Unit per dial cord drawing. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1 MFD.	High side to front section of tuning cap. Low side to chassis.	455KC	BC (center position)	High freq. end of dial.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
2.	.1 MFD.	"	"	"	Low freq. end of dial.	"	A5	Adjust for minimum output.
3.	.05 MFD.	High side to Pin 1 (grid) 6BA6 2nd IF Tube (4). Low side to chassis.	10.7MC (unmodulated)	FM (fully clockwise)	High freq. end of dial.	VTVM connected from Pin 7 of 6AL5 to chassis.	A6,A7.	Adjust for maximum deflection.
4.	.05 MFD.	High side to Pin 1 (grid) 6BA6 1st IF Tube (3). Low side to chassis.	"	"	"	"	A8,A9.	"
5.	.05 MFD.	High side to Pin 1 (grid) 6BE6. Low side to chassis.	10.6MC (unmodulated)	"	"	"	A10	"
6.	.05 MFD.	"	10.8MC (unmodulated)	"	"	"	A11	"
7.	.05 MFD.	"	10.7MC (unmodulated)	"	"	"	A12	"
8.	.05 MFD.	High side to Pin 1 (grid) 6AU6 3rd IF Tube (5). Low side to chassis.	"	"	"	"	A13	"
9.	.05 MFD.	"	"	"	"	VTVM connected from junction of 2 100KΩ resistors & junction of cap 31 & 32. (See preliminary alignment notes)	A14	Adjust for zero deflection.
10.	150Ω in series with each lead.	High side to ungrounded FM ant. terminal. Low side to chassis. (Disconnect Internal ant.)	108MC (unmodulated)	"	108MC	VTVM connected from Pin 7 of 6AL5 to chassis.	A15	Adjust for maximum deflection.
11.	"	"	88MC (unmodulated)	"	88MC	"	A16	Adjust iron core (hold brass in position) for maximum deflection.
12.	"	"	98MC (unmodulated)	"	98MC	"	A16	Adjust both iron and brass cores for maximum deflection. Repeat Steps 10, 11 and 12 until no further improvement can be made.
13.	"	"	106MC (unmodulated)	"	Tune for maximum deflection.	"	A17,A18	Adjust for maximum deflection.
14.	"	"	90MC (unmodulated)	"	"	"	A19,A20	Adjust iron cores (hold brass in place) for maximum deflection.
15.	"	"	100MC (unmodulated)	"	"	"	A19,A20	Adjust both iron and brass cores for maximum deflection. Repeat Steps 13, 14 and 15 until no further improvement can be made.
16.	200MMFD	High side to AM ungrounded lug on ant. terminal strip. Low side to chassis.	1600KC	BC	1600KC	Across voice coil	A21	Adjust for maximum output.
17.	200MMFD	"	1400KC	"	Tune for maximum output.	"	A22	"

FARNSWORTH MODELS
GK-100, GK-102, GK-103, GK-104



FARNSWORTH MODEL GK-102

TRADE NAME	Farnsworth, Models GK-100, GK-102, GK-103, GK-104
MANUFACTURER	Farnsworth Television & Radio Corp., Fort Wayne, Ind.
TYPE SET	AC Operated Phono-Radio Combination FM-AM Superheterodyne Receiver with Self Contained Loop Antenna and Pushbutton Tuning.
TUBES (TEN)	6AG5 FM RF Amp., 6SA7 AM Converter, 6SB7Y FM Converter, 6SG7 AM RF-FM 1st IF Amp., 6SF7 AM IF-Det.-AVC; FM 2nd IF-Amp., 6H6 FM Det.-AVC, 6SL7GT 1st Audio Amp. Phase Inv., 6V6GT Power Output, 6V6GT Power Output, 5Y3GT Rectifier.
POWER SUPPLY	110-120 Volts AC
RATING	.620 Amps. @ 117 Volts AC
TUNING RANGE	- BROADCAST 540-1620KC FM 87.5-108.5MC

FARNSWORTH MODELS
GK-100, GK-102, GK-103, GK-104

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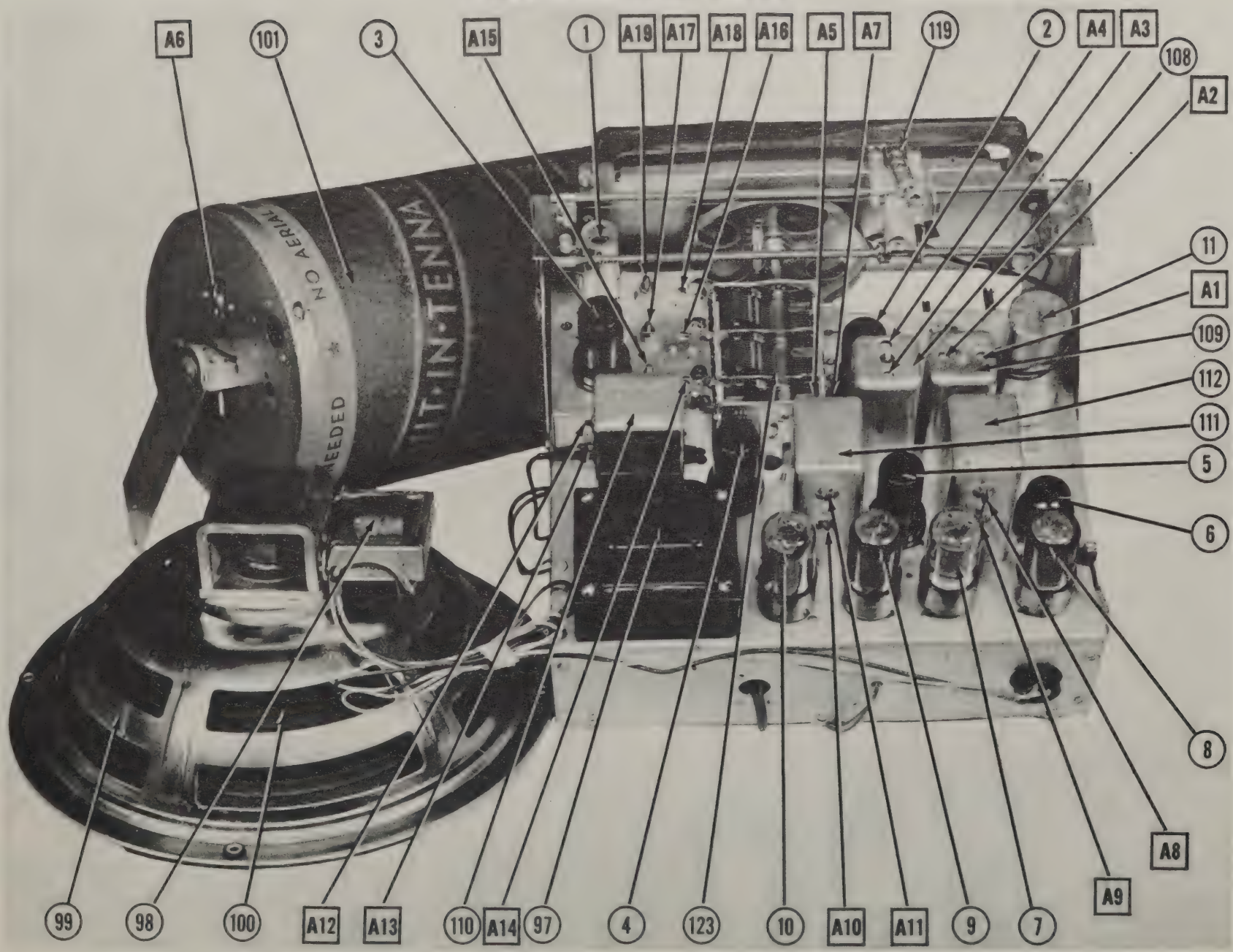
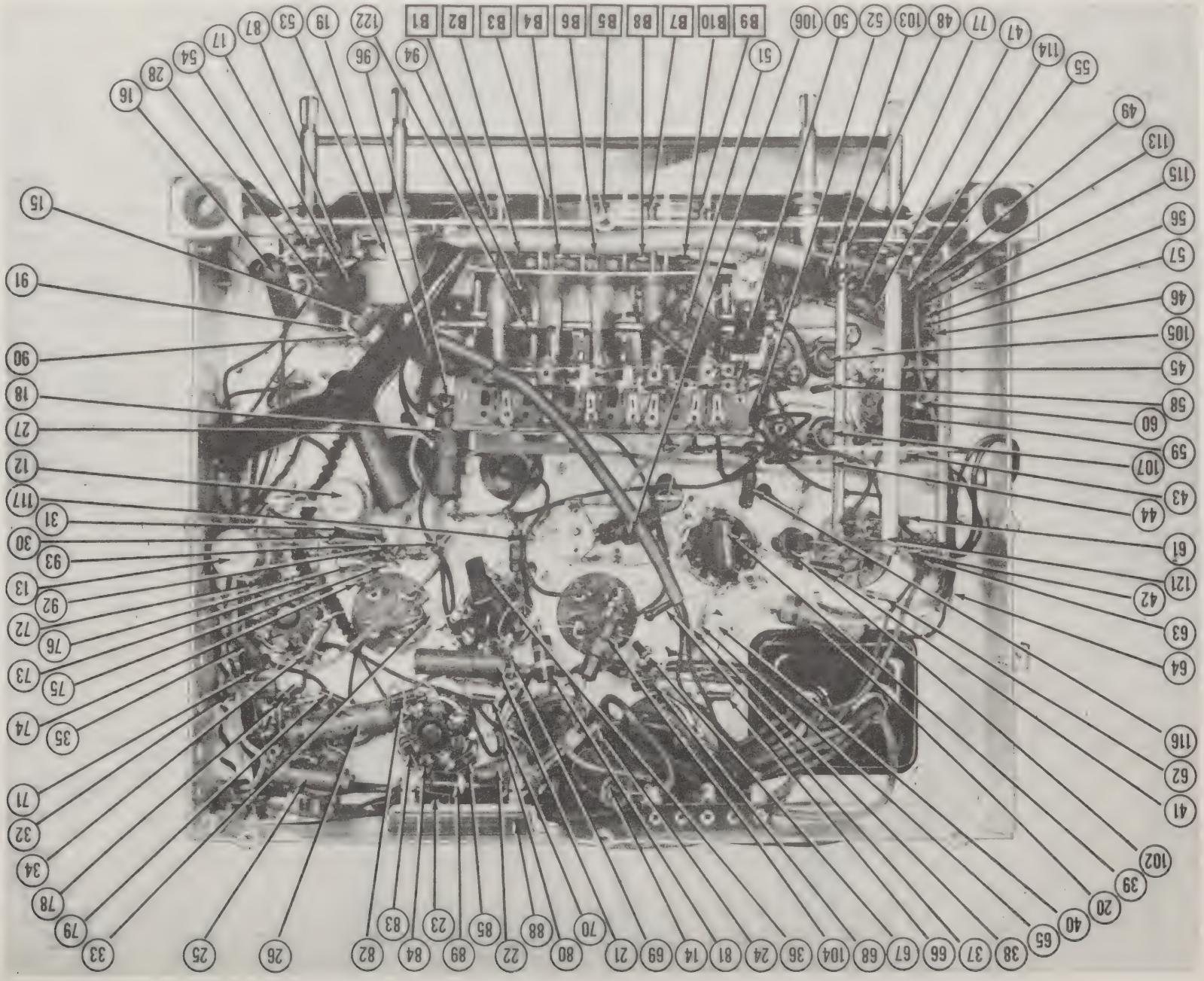
DATE 9/47 SET 23 FOLDER 4713-8

CHASSIS—TOP VIEW

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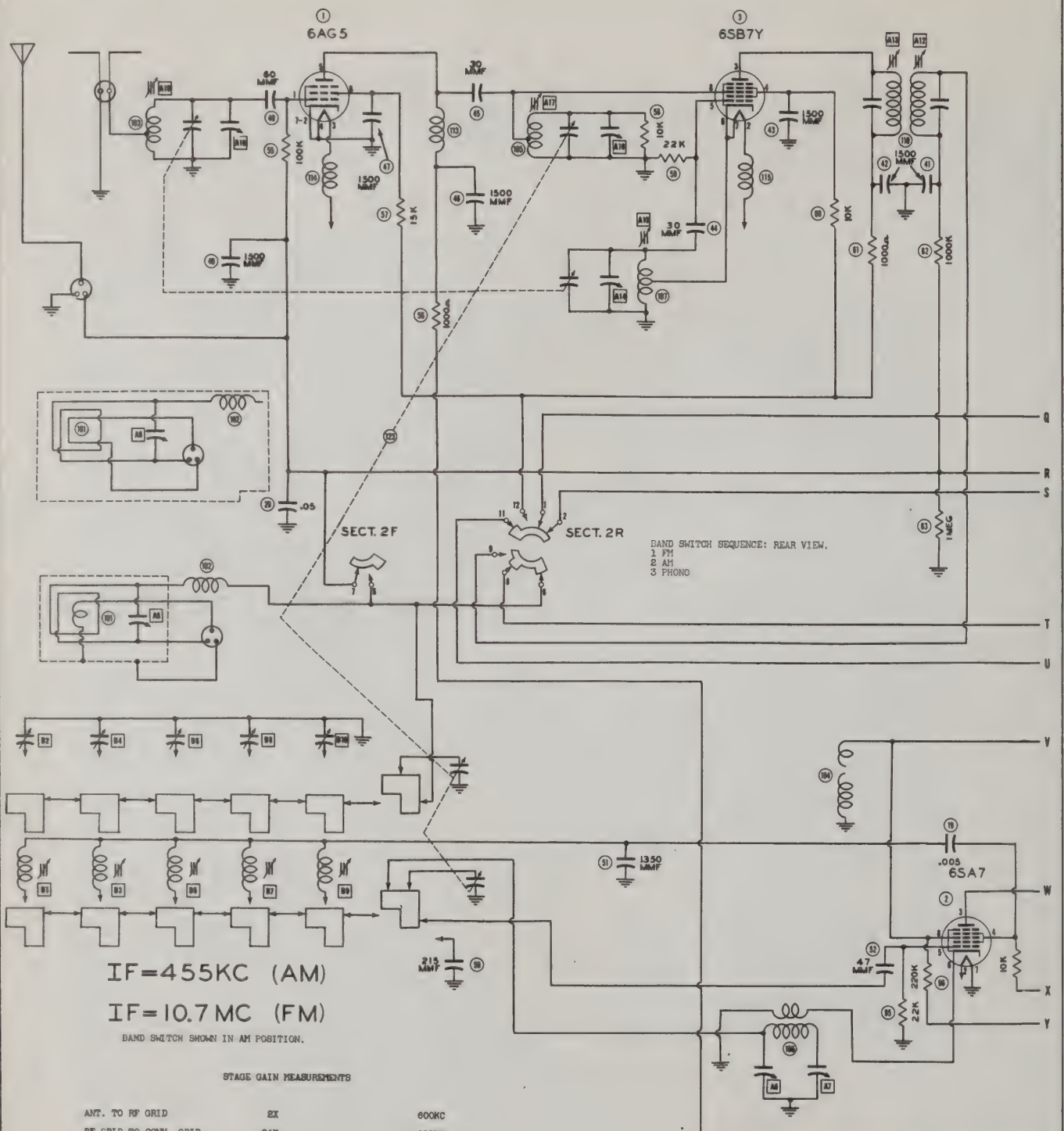

STAGE GAIN MEASUREMENTS

ANT. TO RF GRID	2X	600KC
RF GRID TO CONV. GRID	24X	600KC
CONVERTER GAIN	25X	IN 600KC
		455KC OUT
1ST IF TRANS.	1X	455KC
IF TUBE	200X	455KC
2ND IF TRANS.	1X	455KC
AUDIO	40X	400∿
[illegible]	20X	400∿

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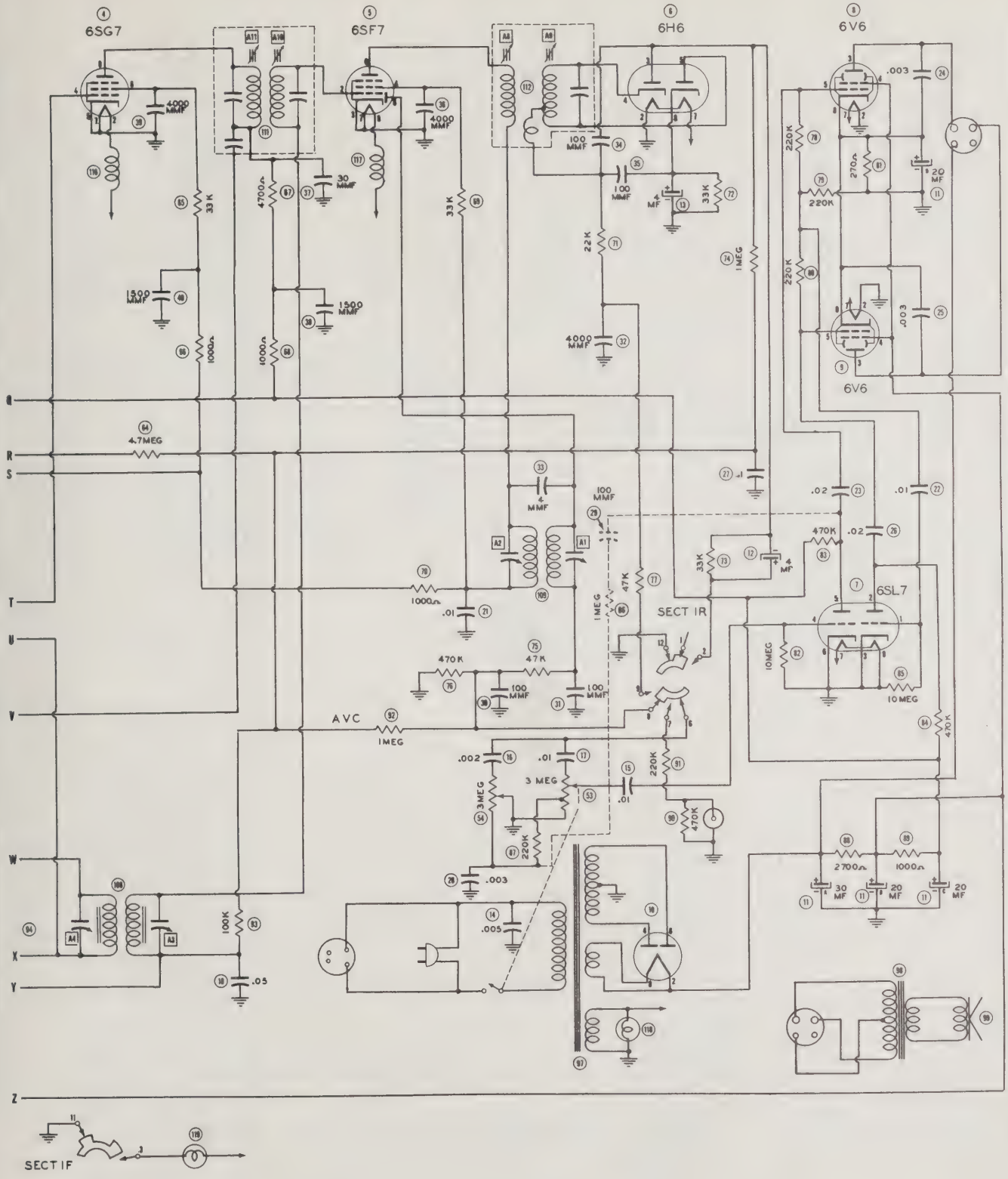
4713-8

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.



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THE COOPERATION OF THE MANUFACTURER OF THIS
RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: FARNSWORTH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	FM RF Amp.	6AU6	6AU6	7BD	
2	AM Converter	6SA7	6SA7	8R	
3	FM "	6SB7Y	6SB7Y	8R	
4	AM RF-FM 1st IF Amp.	6SG7	6SG7	8BK	
5	AM IF-Det.-AVC; FM 2nd.IF-Amp.	6SF7	6SF7	7AZ	
6	FM Det.-AVC	6H6	6H6	7Q	
7	1st Audio Amp. Phase Inv.	6SL7GT	6SL7GT	8BD	
8	Power Output	6V6GT	6V6GT	7AC	
9	" "	6V6GT	6V6GT	7AC	
10	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FARNSWORTH PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: SOLAR PART No.	REPLACEMENT DATA: SPRAGUE PART No.	REPLACEMENT DATA: AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
11A	30	450	25214	UP9DJ53	FP429	DY-403	EL-424	AF4444J	● Filter
B	20	450							■ "
C	20	450							▲ "
D	20	25							Output Cathode Bypass
12	4	50	25316	BR550	TC40	M-4-150	TA-55	PRS-150-4	Ratio Det. Bias Net
13	4	50	25316	BR550	TC40	M-4-150	TA-55	PRS-150-4	" " " "
14	.005	600	25183	DT6D5	TP408	S-6-005	TC-25	684-005	Line Bypass
15	.01	400	25194	DT4S1	TP421	S-4-01	TC-11	464-01	Audio Coupling
16	.002	600	25185	DT6D2	TP405	S-6-002	TC-22	664-002	Tone Compensation
17	.01	600	25194	DT6S1	TP410	S-6-01	TC-11	684-01	Audio Coupling
18	.05	200	25196	DT4S5	TP426	S-4-05	TC-15	464-05	AVC Filter
19	.005	600	25183	DT6D5	TP408	S-6-005	TC-25	684-005	AM Conv. Screen Bypass
20	.05	200	25196	DT4S5	TP426	S-4-05	TC-15	464-05	AVC Filter
21	.01	600	25194	DT6S1	TP410	S-6-01	TC-11	684-01	AM IF Decoup.
22	.01	400	25194	DT4S1	TP421	S-4-01	TC-11	464-01	Audio Coupling
23	.02	600	25195	DT6S2	TP412	S-6-02	TC-12	684-02	" "
24	.003	600	25184	DT6D3	TP406	S-6-003	TC-23	684-003	Output Plate Bypass
25	.003	600	25184	DT6D3	TP406	S-6-003	TC-23	684-003	" " "
26	.02	600	29195	DT6S2	TP412	S-6-02	TC-12	684-02	Audio Coupling
27	.1	200	25215	DT4P1	TP428	S-4-1	TC-1	464-.1	AVC Filter
28	.003	600	25164	DT6D3	TP406	S-6-003	TC-23	684-003	Tone Comp See Note 1
29	100	500	25188	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	" " See Note 1
30	100	500	25188	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Diode Filter
31	100	500	25188	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	" "
32	4000	300	25273	1D5D4	MC463	MW.5-24	1FM-24	1467-004	De-emphasis
33	4		25327						IF Coupling
34	100	500	25188	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Ratio Detector Load
35	100	500	25188	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	" " "
36	4000	300	25273	1D5D4	MC463	MW.5-24	1FM-24	1467-004	AM IF Screen Bypass
37	30		25329						FM IF Plate Decoup.
38	1500		25273	1W5D15	MC456	MW.5-215	1FM-215	1467-0015	AM RF Plate Decoup.
39	4000	300	25271	1D5D4	MC463	MW.5-24	1FM-24	1467-004	AM RF Screen Bypass
40	1500		25273	1W5D15	MC456	MW.5-215	1FM-215	1467-0015	AM RF Screen Decoup.
41	1500		25273	1W5D15	MC456	MW.5-215	1FM-215	1467-0015	AVC Filter
42	1500		25273	1W5D15	MC456	MW.5-215	1FM-215	1467-0015	FM Converter Plate Decoup.
43	1500		25273	1W5D15	MC456	MW.5-215	1FM-215	1467-0015	FM Converter Screen Byp.
44	30		25329						FM Osc. Grid Cap.
45	30		25329						RF Coupling
46	1500		25273	1W5D15	MC456	MW.5-215	1FM-215	1467-0015	FM RF Plate Decoup.
47	1500		25273	1W5D15	MC456	MW.5-215	1FM-215	1467-0015	FM RF Screen Bypass
48	60		25333						RF Coupling
49	1500		25273	1W5D15	MC456	MW.5-215	1FM-215	1467-0015	AVC Filter
50	215	500	25212						Osc. Feedback
51	1350	500	25213						" "
52	47		25193						AM Osc. Grid Cap.

Note 1 - Not used in all models.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS: FIELD	RATINGS: VC IMP.	REPLACEMENT DATA: FARNSWORTH PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA:	INSTALLATION NOTES
99A	PM	4.0Ω	81169	ST-101*		*Replace output transformer to match 8Ω voice coil.
B			13772	Mod. P12-T		Alternate Speaker
	CONE DIA.	VC DIA.				
100	11-3/4"	1-1/8"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: FARNSWORTH PART No.	REPLACEMENT DATA: MEISSNER PART No.	
101A	Loop Ant.			38859		Used in Model GK104
B	" "	95Ω	1Ω	38696		Used in Models GK102, GK103
102	Loop Load. Coil		1.5Ω	38845		
103	FM Ant.Coil		0Ω	38690		
104	BC Wave Trap		†	38484		†No continuity
105	FM RF Coil		0Ω	38691		
106	BC Osc.Coil	1Ω	5.5Ω	38694	14-1040	
107	FM Osc.Coil		0Ω	38692		
108	AM Input IF	10Ω	9Ω	38681	16-6658	
109	AM OutputIF	9Ω	9Ω	38682	16-6660	
110	FM 1st IF	.5Ω	.5Ω	38683		
111	FM 2nd IF	.5Ω	.5Ω	38684		
112	Ratio Det. Trans.	2Ω	0Ω .8Ω	38685		Tertiary Winding 15.8Ω. Secondary is 0Ω
113	RF Choke	.1Ω		38661		
114	"	.1Ω		38661		
115	"	.1Ω		38661		
116	"	.1Ω		38661		
117	"	.1Ω		38661		

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: FARNSWORTH PART No.	REPLACEMENT DATA:	INSTALLATION NOTES
118	Bayonet	6-8	0.25A	Blue	42185		Type 44
119	"	"	"	"	42185		" "

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: FARNSWORTH PART No.	REPLACEMENT DATA: ASTATIC PART No.	REMARKS
120		L71S	

MISCELLANEOUS

ITEM No.	PART NAME	FARNSWORTH PART No.	NOTES
121	Band Switch	90214	
122	PB Trimmer Strip	26175	PB Assembly
	PB Switch	90118	" "
	PB Coil Strip	38405	" "
123	Tuning Cap.	26237	(13-465 MMF, 13-465 MMF)
A5	Trimmer Strip	26240	BC Osc. Trimmer
A7			" " Padder
A6	Trimmer Cap.	26031	Loop Ant. Trimmer GK102
	Trimmer Cap.	26032	" " " GK104
A14	Trimmer Cap.	26231	FM Osc. Adj. (5-20 MMF)
A16	" "	26231	FM RF Adj. (5-20 MMF)
A18	" "	26231	FM Ant. Adj. (5-20 MMF)
	Glass Dial	31338	
	Dial Pointer	07373	
	Escutcheon	561397	Dial
	Knob	59134	GK102 WA
	"	59450	" BL
	"	59451	GK103 & GK104
	Escutcheon	59049	Pushbutton
	Pushbutton	59030	GK102 WA, GK103 & GK104
	"	59441	GK102 BL

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	FARNSWORTH PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
53A	3 Meg.	1	78057				Volume Control
B	Shaft		Not Req.				Attach to 53A per instructions
C	Switch		" "				" " " " "
54A	3 Meg.	1	78072	UM165	D13-140	AM-67-Z	Tone Control
B	Shaft		Not Req.	SS25	E	KSS-3	Attach to 54A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	FARNSWORTH PART No.	IRC PART No.	
55	100KΩ	½	77214	BTS-100K	Br.-Blk.-Yl. FM-RF Grid
56	1000Ω	½	77262	BTS-1000	Br.-Blk.-Red FM-RF Plate Decoupling
57	15KΩ	½	77265	BTS-15K	Br.-Grn.-Or. FM-RF Screen Dropping
58	10KΩ	½	77212	BTS-10K	Br.-Blk.-Or. FM-RF Coil Shunt
59	22KΩ	½	77266	BTS-22K	Red-Red-Or. FM Oscillator Grid
60	10KΩ	2	77013	BT-2-10K	Br.-Blk.-Or. FM Converter Screen Dropping
61	1000Ω	½	77262	BTS-1000	Br.-Blk.-Red FM Converter Plate Dropping
62	100KΩ	½	77214	BTS-100K	Br.-Blk.-Yl. AVC Network
63	1 Meg.	½	77218	BTS-1 Meg.	Br.-Blk.-Grn. " "
64	4.7 Meg.	½	77272	BTS-4.7 Meg.	Yl.-Vi.-Grn. AVC Network
65	33KΩ	½	77267	BTS-33K	Or.-Or.-Or. FM 1st IF Screen Dropping
66	1000Ω	½	77262	BTS-1000	Br.-Blk.-Red FM 1st IF Screen Decoupling
67	4700Ω	½	77211	BTS-4700	Yl.-Vi.-Red FM 1st IF Plate Decoupling
68	1000Ω	½	77262	BTS-1000	Br.-Blk.-Red FM 1st IF Plate Decoupling
69	33KΩ	½	77267	BTS-33K	Or.-Or.-Or. FM 2nd IF Screen Dropping
70	1000Ω	½	77262	BTS-1000	Br.-Blk.-Red FM 2nd IF Plate Decoupling
71	22KΩ	½	77266	BTS-22K	Red-Red-Or. De-emphasis
72	33KΩ	½	77267	BTS-33K	Or.-Or.-Or. Ratio Detector Bias Network
73	33KΩ	½	77267	BTS-33K	Or.-Or.-Or. Ratio Detector Bias Network
74	1 Meg.	½	77218	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
75	47KΩ	½	77213	BTS-47K	Yl.-Vi.-Or. Diode RF Filter
76	470KΩ	½	77217	BTS-470K	Yl.-Vi.-Yl. Diode Load
77	47KΩ	½	77213	BTS-47K	Yl.-Vi.-Or. FM RF Filter
78	220KΩ	½	77216	BTS-220K	Red-Red-Yl. Output Grid
79	220KΩ	½	77216	BTS-220K	Red-Red-Yl. Output Grid
80	220KΩ	½	77216	BTS-220K	Red-Red-Yl. Output Grid
81	270Ω	2	77189	BW-2-270	Red-Vi.-Br. Output Cathode
82	10 Meg.	½	77274	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
83	470KΩ	½	77217	BTS-470K	Yl.-Vi.-Yl. AF Plate Load
84	470KΩ	½	77217	BTS-470K	Yl.-Vi.-Yl. Phase Inverter Plate Load
85	10 Meg.	½	77274	BTS-10 Meg.	Br.-Blk.-Blue Phase Inverter Grid
86	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. Tone Compensation-See Note 1
87	220KΩ	½	77216	BTS-220K	Red-Red-Yl. Tone Compensation-See Note 1
88	2700Ω	4.7	77243	AB-2500	Filter
89	1000Ω	2	77304	BT-2-1000	Br.-Blk.-Red Filter
90	470KΩ	½	77217	BTS-470K	Yl.-Vi.-Yl. Phono Shunt
91	220KΩ	½	77216	BTS-220K	Red-Red-Yl. Series Phono
92	1 Meg.	½	77218	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
93	100KΩ	½	77214	BTS-100K	Br.-Blk.-Yl. AVC Network
94	10KΩ	2	77013	BT-2-10K	Br.-Blk.-Or. AM-Converter Screen Dropping
95	22KΩ	½	77266	BTS-22K	Red-Red-Or. AM Oscillator Grid
96	220KΩ	½	77216	BTS-220K	Red-Red-Yl. AM Converter Grid

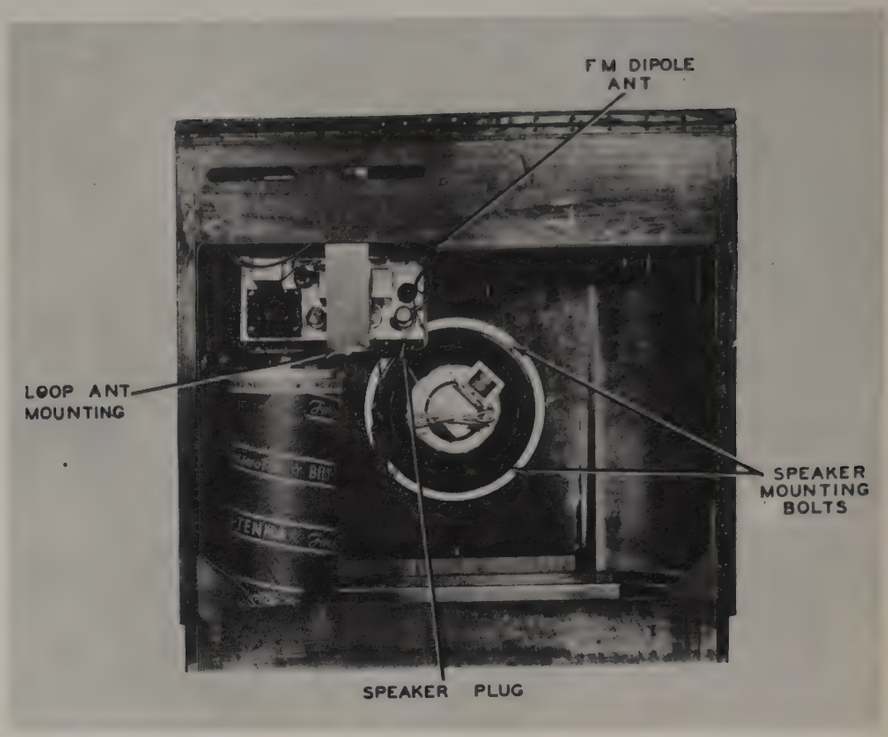
Note 1-Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA		
	PRI.	SEC. 1	SEC. 2	SEC. 3	FARNSWORTH PART No.	STANCOR PART No.	THORDARSON PART No.
97	117V AC @ .62A	600V CT @ .082A	5.1V AC @ 2.0A	6.5V AC @ 3.3A	94204-Z	P-6012	T22R04

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		FARNSWORTH PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
98A	12000Ω CT	4.0Ω	770Ω CT	.6Ω	94239	A-3870	T22S56		
B					94195				Alternate Transformer.



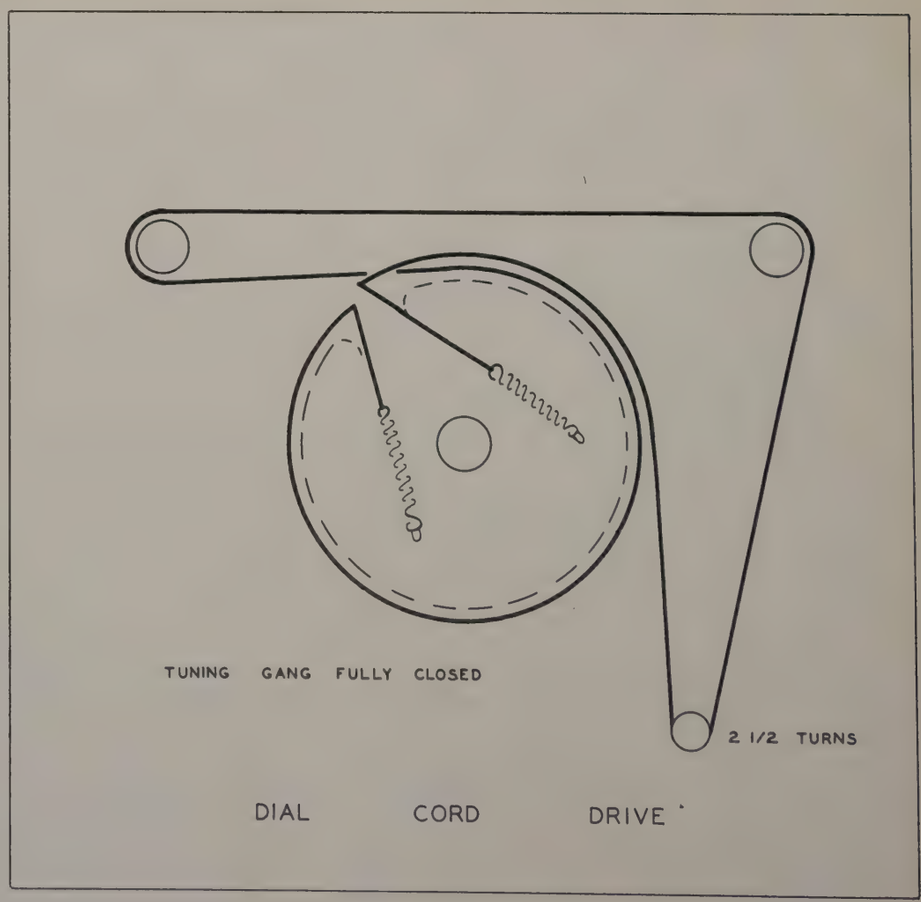
DISASSEMBLY INSTRUCTIONS

1. Remove four push on type control knobs.
2. Remove two plugs from built in antenna.
3. Remove four Phillips head screws holding built in antenna in cabinet. Remove antenna from cabinet.
4. Remove FM antenna plug from chassis.
5. Remove speaker plug from chassis.
6. Unsolder two leads to phono compartment light from chassis.
7. Remove phono pick-up plug from chassis.
8. Remove phono-motor plug from phono motor.
9. Remove four bolts holding chassis in cabinet. Remove chassis from cabinet.
10. Remove four hex nuts holding speaker in cabinet. Remove speaker from cabinet.
11. Remove eight hex head screws holding bottom chassis cover board to chassis. Remove from chassis.

PUSHBUTTON ADJUSTMENTS

The frequency range of pushbuttons reading from left to right are as follows; 550-1250KC, 600-1350KC, 650-1450KC, 650-1450KC and 750-1600KC.

1. Turn on receiver and allow to warm up for 10 or 15 minutes.
2. Make a list of 5 desired stations from low to high freq. making sure each will fall within the range of button to be used.
3. Depress "Dial" button and tune in first desired station with manual tuning control.
4. Depress first button from left and tune in desired station with B_1.
5. Adjust B_2 for maximum volume.
6. Follow same procedure as outlined above for remaining buttons adjusting B3, B5, B7, and B9 to tune in stations and B4, B6, B8 and B10 for maximum volume.
7. Repeat all adjustments for optimum performance.



DATE 9/47 SST 23
FOLDER 4713-C

*TAKEN IN RECEPTION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
* 1	6AG5	-.3VDC	0V.	6.3VAC	0V.	175VDC	120VDC	0V.	--
2	6SA7	0V.	6.5VAC	175VDC	160VDC	-5VDC§	0V.	0V.	-.2VDC
* 3	6SB7Y	0V.	6.5VAC	145VDC	75VDC	-.5VDC	0V.	0V.	0V.
4	6SG7	0V.	6.5VAC	0V.	-.3VDC	0V.	75VDC	0V.	130VDC
5	6SF7	0V.	-.3VDC	0V.	77VDC	-.3VDC	160VDC	0V.	6.5VAC
* 6	6H6	0V.	0V.	-.3VDC	0V.	0V.	0V.	6.5VAC	3VDC
7	6SL7GT	-.3VDC	55VDC	0V.	-.3VDC	50VDC	0V.	6.5VAC	0V.
8	6V6GT	0V.	0V.	300VDC	212VDC	0V.	0V.	6.5VAC	12VDC
9	6V6GT	0V.	0V.	300VDC	212VDC	0V.	0V.	6.5VAC	12VDC
10	5Y3GT	0V.	310VDC	0V.	300VAC	0V.	300VAC	0V.	310VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
* 1	6AG5	1.1 MEG.	0Ω	.4Ω	0Ω	500KΩ	110KΩ	0Ω	--
2	6SA7	0Ω	.2Ω	500KΩ	410KΩ	82KΩ	1Ω	0Ω	1.5 MEG
* 3	6SB7Y	0Ω	.4Ω	200KΩ	110KΩ	82KΩ	0Ω	0Ω	0Ω
4	6SG7	0Ω	.4Ω	0Ω	1.5 MEG.	0Ω	540KΩ	0Ω	410KΩ
5	6SF7	0Ω	1.5 MEG.	0Ω	330KΩ	80KΩ	500KΩ	0Ω	.4Ω
* 6	6H6	0Ω	0Ω	30KΩ	INF.	INF.	INF.	.2Ω	30KΩ
7	6SL7GT	10 MEG.	1 MEG.	0Ω	10 MEG.	1 MEG.	0Ω	.2Ω	0Ω
8	6V6GT	0Ω	0Ω	500KΩ	500KΩ	430KΩ	200KΩ	.2Ω	270Ω
9	6V6GT	0Ω	0Ω	500KΩ	500KΩ	430KΩ	200KΩ	.2Ω	270Ω
10	5Y3GT	INF.	500KΩ	INF.	140Ω	INF.	140Ω	INF.	500KΩ

§TAKEN WITH VACUUM-TUBE VOLTMETER.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

When using an oscilloscope for FM-IF alignment connect the synchronized sweep voltage from the signal generator to the horizontal deflection amplifier. The lead to the scope must be shielded and of low total capacity. The scope patterns to be strived for in alignment were obtained under ideal conditions. They should be duplicated as nearly as possible.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	200MMF.	High side to ext. ant. lead. Low side to chassis.	455KC	BC (center position)	Tuning cap. fully open.	Across voice coil	A1, A2, A3, A4.	Adjust for maximum output.
2	200MMF.	"	1600KC	"	1600KC	"	A5	"
3	200MMF.	"	1500KC	"	Tune for maximum out.	"	A6	"
4	200MMF.	"	600KC	"	"	"	A7	Rock tuning capacitor and adjust for maximum output. Repeat Steps 2, 3 and 4 until no further improvement can be made.
						SCOPE CONNECT		
5	.0023 MFD.	High side to Pin 2 of 6SF7. Low side to chassis.	10.7MC (Freq.Mod. 150KC deviation)	FM (fully clockwise)	Tuning cap. fully open.	Disconnect cap. 12 from Pin #3 of 6H6. Connect scope vertical input to pin #3 of 6H6. Ground scope to chassis.	A8,A9.	Remove 6SL7 tube from socket. Back out A9 as far as possible and adjust A8 for pattern of Figure A. Then adjust A9 for pattern of figure B and until both sides of this pattern are symmetrical.
6	.0023 MFD.	High side to Pin 4 of 6SG7. Low side to chassis.	"	"	"	"	A10,A11	Adjust for maximum amplitude and symmetry as in Figure A.
7	.0023 MFD.	High side to Pin 8 of 6SB7Y. Low side to chassis.	"	"	"	"	A12,A13	Adjust A12 for maximum amplitude and symmetry as in Figure A. Adjust A13 for pattern of Figure C making both sides as symmetrical as possible.
8	.0023 MFD.	"	"	"	"	Reconnect cap. 12. Connect scope vertical input to Pin #6 of 6H6.	A14	Pattern should appear as in Figure D. If it does not adjust A8 and A9 for maximum amplitude and straightness of pattern from 1 to 2 with a horizontal line from 3 to 4 crossing center of pattern from 1 to 2.
						OUTPUT METER		
9	300Ω carbon res.	High side to ungrounded FM ant. Low side to chassis.	107.9MC (Freq. modulated at 400~)	"	Channel 300	Across voice coil	A14	Replace 6SL7 Tube in its socket. Adjust for maximum output.
10	.0033 MFD.	High side to Pin 4 of 6SG7. Low side to chassis.	87.9MC (Freq. mod. at 400~)	"	Channel 200	"	A15	Adjust for maximum output. Repeat Steps 9 & 10 until no further improvement can be made.
11	"	"	105MC (Freq. mod at 400~)	"	Tune for maximum output. (Approx. Channel 265)	"	A16	Adjust for maximum output.
12	"	"	92MC (Freq.mod. at 400~)	"	Tune for maximum output. (Approx. Channel 220)	"	A17	Adjust for maximum output. Repeat Steps 11 & 12 until no further improvement can be made.
13	"	"	105MC (Freq.mod. at 400~)	"	Tune for maximum output. (Approx. Channel 265)	"	A18	Adjust for maximum output.
14	"	"	92MC (Freq.mod. at 400~)	"	Tune for maximum output. (Approx. Channel 220)	"	A19	Adjust for maximum output. Repeat Steps 13 & 14 until no further can be made.
15	.0033 MFD.	IF AN OSCILLOSCOPE IS NOT AVAILABLE AN ALTERNATE METHOD OF FM ALIGNMENT MAY BE USED AS FOLLOWS. A VTVM SHOULD BE USED AS AN OUTPUT INDICATOR.						
16	"	High side to Pin #6 of 6SG7. Low side to chassis.	10.7MC (Unmodulated)	FM	Tuning cap. fully open.	VTVM to Pin #6 of 6H6 (junction of cap. 34 & 35) & chassis	A8, A9	Back out A9 as far as possible and adjust A8 for maximum voltage.
17	"	High side to Pin #6 of 6SB7Y. Low side to chassis.	10.7MC (Unmodulated)	"	"	"	A10,A11	Adjust for maximum voltage.
18	"	"	87.5MC (Unmodulated)	"	"	"	A12,A13	"
19	300Ω carbon res.	High side to ungrounded FM Ant. Low side to chassis.	87.5MC (Unmodulated)	"	Tuning cap. fully closed	VTVM connected to Pin #3 of 6H6 and chassis.	A9	Adjust for zero voltage.
20	"	"	106.9MC (Unmodulated)	"	Tuning cap. fully open.	"	A14	Adjust for maximum voltage. Repeat Steps 19 & 20 until no further improvement can be made.
21	"	"	92MC (Unmodulated)	"	Tune for maximum output. (Approx. 220)	"	A17, A19	Adjust for maximum voltage.
22	"	"	105MC (Unmodulated)	"	Tune for maximum output. (Approx. 280)	"	A16,A18	Adjust for maximum voltage. Repeat Steps 21 & 22 until no further improvement can be made.

A

B

C

D

FEDERAL
MODEL 1040 T

FEDERAL
MODEL 1040 T

FEDERAL MODEL 1040T

TRADE NAME	Federal Model 1040T
MANUFACTURER	Federal Telephone & Radio Corp., 591 Broad St., Newark, N.J.
TYPE SET	AC-DC Superheterodyne with Loop Antenna
TUBES (FIVE)	Types, 12BE6 Converter, 12BA6 IF Amp., 12AT6 Det.-AVC-AF, 50L6GT Power Output, 35W4 Rectifier.
POWER SUPPLY	110-120 Volts AC-DC
TUNING RANGE—BROADCAST	535-1620KC RATING .250 Amps. @ 117V AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer parallel with base of dial. Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to Pin 7(grid) of 12BE6. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2	200MMFD.	High side to ext. ant. lead. Low side to chassis.	1600KC	1600KC	"	A5	Adjust for maximum output.
3	200MMFD.	"	1400KC	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

FEDERAL MODEL 1-40T

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: FEDERAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12BE6	12BE6	7CH	
2	IF Amp.	12BA6	12BA6	7BK	
3	Det.-AVC-AF	12AT6	12AT6	7BT	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35W4	35W4	5BJ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FEDERAL PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	30	150		BRD351E	2N520	M-5030-150	TA-530	PRSA150-50-30	Filter - Blue
B	50	150							" - Red
7	.05	400		DT4S5	TP426	S-4-05	TC-15	484-05	Line Filter
8	.01	400		DT4S1	TP421	S-4-01	TC-11	484-01	Output Plate Bypass
9	.005	400		DT6D5	TP408	S-6-005	TC-25	484-005	Audio Coupling
10	.005	400		DT6D5	TP408	S-6-005	TC-25	484-005	" "
11	.05	400		DT4S5	TP426	S-4-05	TC-15	484-05	AVC Filter
12	.2	400		DT4P2	TP429	S-4-2	TC-2	484-.2	Line Isolation
13	.002	600		DT6D2	TP405	S-6-002	TC-22	684-002	Ext. Ant. Coupling
14	750	500							Audio Plate Bypass
15	150	500		5W5T15	MC236	MO.5-315	1FM-315	1468-00015	Diode Filter
16	100	500		5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Osc. Grid Capacitor

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FEDERAL PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
17A	500KΩ	1		MK401	D13-133	AM-60-Z	Volume Control
B	Shaft			Not Req.	E	KSS-3	Attach to 17A per instructions
C	Switch			M26	41	SW-A	" " " " "

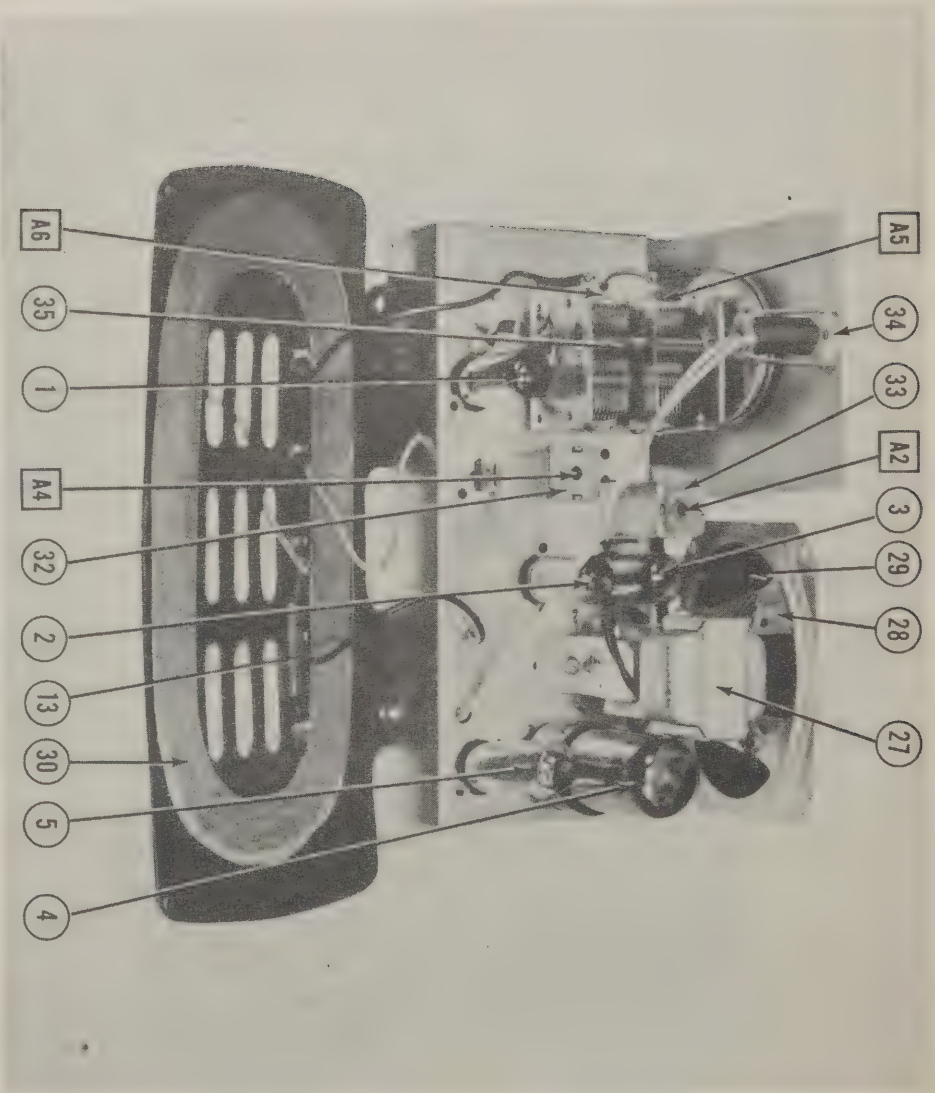
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FEDERAL PART No.	IRC PART No.	IDENTIFICATION CODES
18	22KΩ	½		BTS-22K	Red-Red-Or. Oscillator Grid
19	150Ω	1		BW-1-150	Br.-Grn.-Br. IF Cathode
20	20KΩ	½		BTS-22K	Red-Blk.-Or. Series Volume Control
21	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
22	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue AF Grid
23	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. AF Plate Load
24	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
25	150Ω	1		BW-1-150	Br.-Grn.-Br. Output Cathode
26	1500Ω	1		BTA-1500	Br.-Grn.-Red Filter

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: FEDERAL PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
27	2200Ω	3.3Ω	21Ω tapped @ 15Ω	.6Ω		A-3876*			*Bend mounting tabs down, file out slots and mount on original bracket. Add extra filter to reduce hum level.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			FEDERAL PART No.	JENSEN PART No.		
	FIELD	VC IMP.		ST-113†		†Fabricate new mounting bracket.
28	PM	3.3Ω		Mod. P4-X		
	CONE DIA.	VC DIA.				
29	4"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

R F COILS

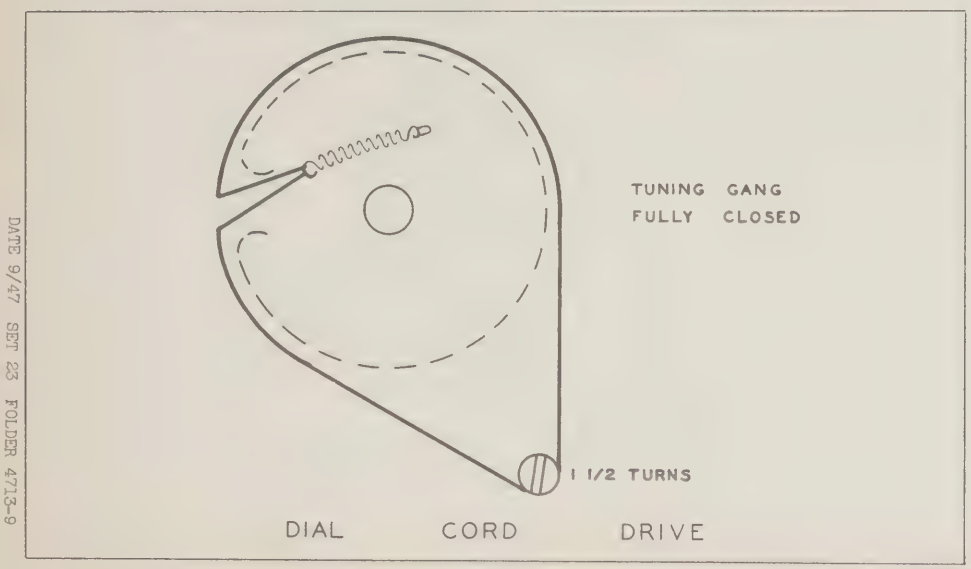
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	FEDERAL PART No.	MEISSNER PART No.	
30	Loop Ant.	.1Ω	1.2Ω			
31	Osc. Coil	.5Ω	4.5Ω		14-1040	
32	Input IF	19Ω	19Ω		16-6668	
33	Output IF	16Ω	16Ω		16-6669	

DIAL LIGHT

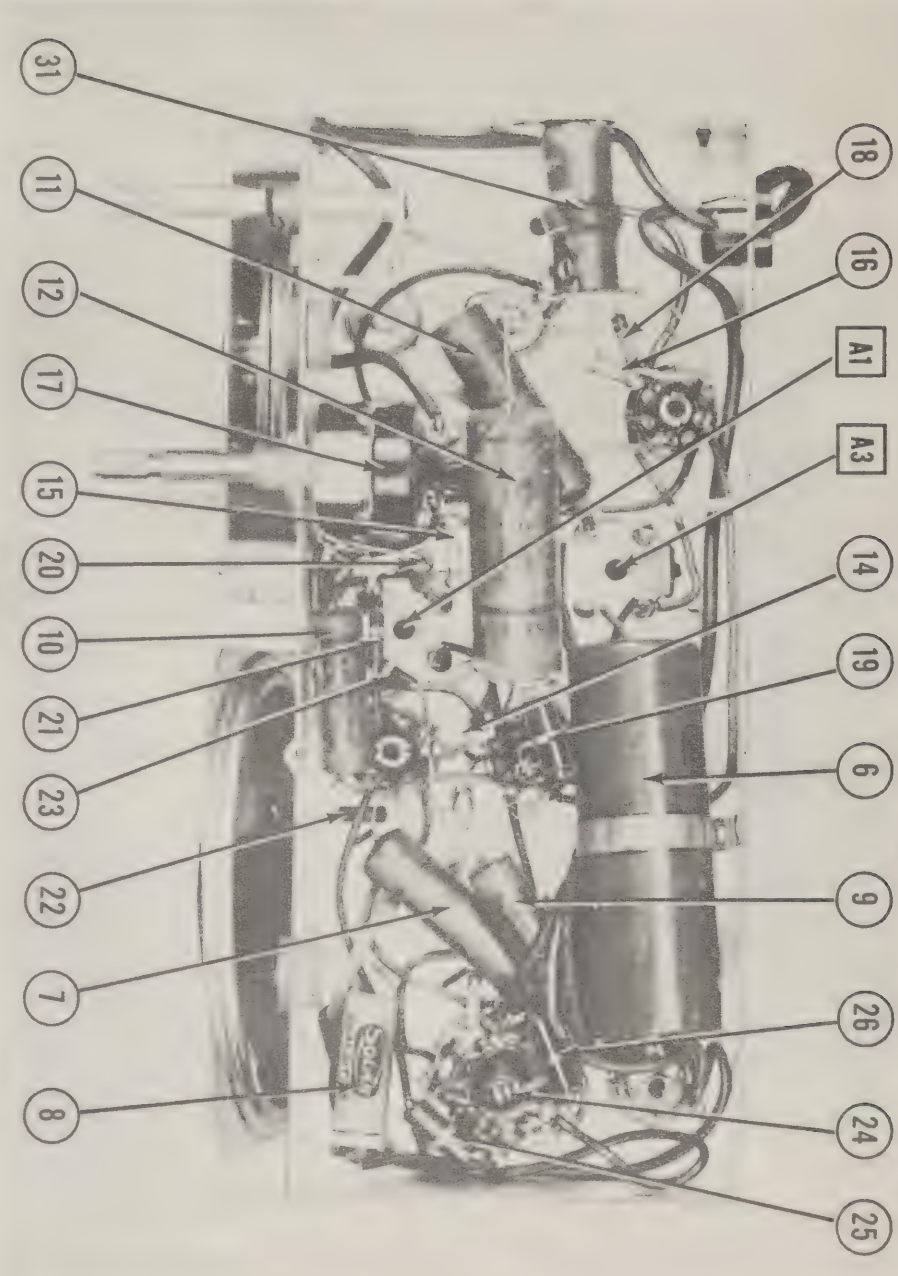
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					FEDERAL PART No.		
34	Bayonet	6-8	0.15	Brown			Type 47

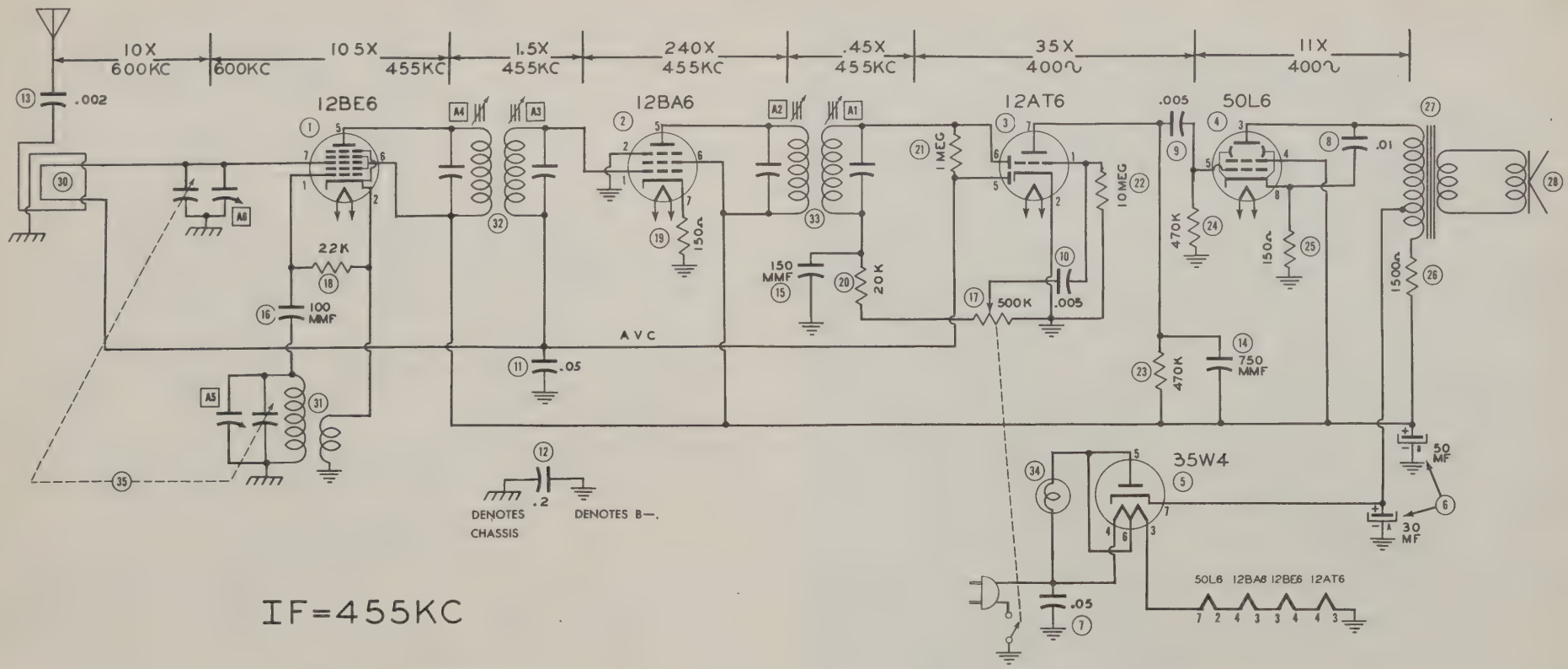
MISCELLANEOUS

ITEM No.	PART NAME	FEDERAL PART No.	NOTES
35	Tuning Cap.		(40-482 MMF, 33-207 MMF)



CHASSIS—BOTTOM VIEW





IF=455KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12BE6	-10.3VDC$	0V.	25VAC	12VAC	90VDC	90VDC	-.5VDC	-
2	12BA6	-.5VDC	0V.	25VAC	38VAC	90VDC	90VDC	1.3VDC	-
3	12AT6	-.5VDC	0V.	0V.	12VAC	-.5VDC	-.5VDC	40VDC	-
4	50L6GT	0V.	38VAC	116VDC	90VDC	0V.	122VDC	87VAC	5.5VDC
5	35W4	0V.	0V.	87VAC	117VAC	112VAC	113VAC	123VDC	-

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12BE6	22KΩ	.5Ω	24Ω	12Ω	300KΩ	300KΩ	1.5 Meg.	-
2	12BA6	1.5 Meg.	0Ω	24Ω	34Ω	300KΩ	300KΩ	150Ω	-
3	12AT6	10 Meg.	0Ω	0Ω	12Ω	1.5 Meg.	500KΩ	770KΩ	-
4	50L6GT	0Ω	34Ω	300KΩ	300KΩ	500KΩ	300KΩ	80Ω	150Ω
5	35W4	INF.	INF.	80Ω	110Ω	108Ω	108Ω	300KΩ	-

$TAKEN WITH VACUUM TUBE VOLTMETER

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC.
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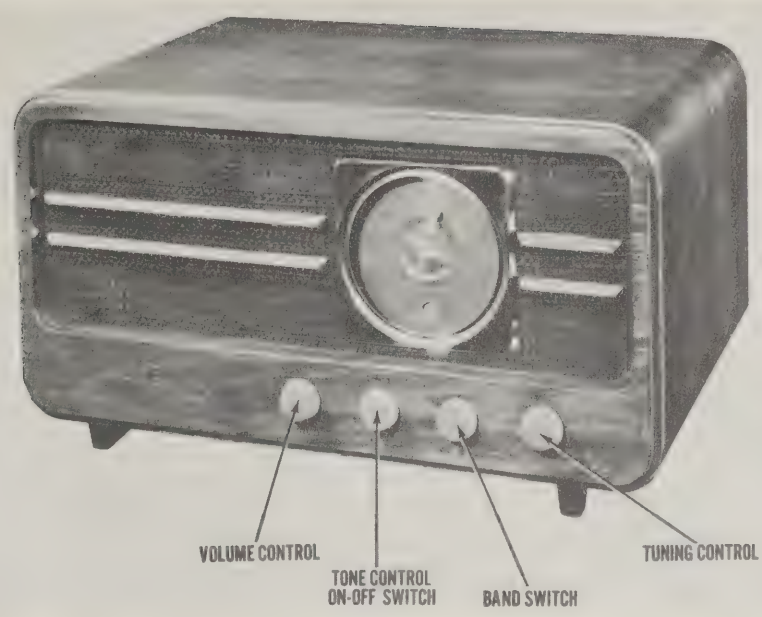
4713-9

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

GENERAL ELECTRIC
MODEL 280 (BATTERY OPERATED)



GENERAL ELECTRIC
MODEL 280 (BATTERY OPERATED)

GENERAL ELECTRIC MODEL 280

TRADE NAME	General Electric, Model 280
MANUFACTURER	General Electric Co., Appl. & Merch. Dept., Bridgeport, Conn.
TYPE SET	Battery Operated 2 Band Superheterodyne Receiver
TUBES (FIVE)	Types, 1N5GT RF Amp., 1R5 Converter, 1N5GT IF Amp., 1H5GT Det.-AVC-AF, 3Q5GT Power Output.
POWER SUPPLY	1.5 Volt "A" Supply and 90 Volt "B" Supply
RATING	310 MA @ 1.5V DC and 16MA @ 90V DC
TUNING RANGE—BROADCAST	540-1710KC SHORT WAVE 5.8-18.3MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.05 MFD	High side to grid cap. of 1N5GT IF Amp. Low side to chassis.	455KC	BC (counter-clockwise)	550KC	Across voice coil	A1,A2.	Adjust for maximum output.
2	.05 MFD.	High side to stator of front section of tuning capacitor. Low side to chassis.	"	"	"	"	A3,A4.	" " " "
3	.05 MFD.	High side to grid cap. of 1N5GT RF Amp. Low side to chassis.	1710KC	"	Tuning cap. fully open.	"	A5	" " " "
4	.05 MFD.	"	1500KC	"	Tune for maximum output.	"	A6	" " " "
5	.05 MFD.	"	600KC	"	"	"	A7	Rock tuning capacitor and adjust for maximum output. Repeat Steps 3, 4 and 5 until no further improvement can be made.
6	200MMF.	High side to external antenna post. Low side to chassis.	1500KC	"	"	"	A8	Adjust for maximum output.
7	.05 MFD.	High side to grid cap. of 1N5GT RF Amp. Low side to chassis.	18.3MC	SW (clockwise)	Tuning capacitor fully open.	Across voice coil	A9	Adjust for maximum output
8	400Ω carbon res.	High side to external antenna post. Low side to chassis.	16MC	"	Tune for maximum out.	"	A10,A11	Rock tuning capacitor and adjust for maximum output.

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DATE 9/47 SET 23 FOLDER 4713-10

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	1N5GT	1N5GT	5Y	
2	Converter	1R5	1R5	7AT	
3	IF Amp.	1N5GT	1N5GT	5Y	
4	Det.-AVC-AF	1H5GT	1H5GT	5Z	
5	Power Output	3Q5GT	3Q5GT	7AP	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6	[illegible]	150	RCE-5001	BR815	TC42	M-8-150	UT-81	PRS150-8	Filter
7	.003	600	UCC-037	DT6D3	TP406	S-6-003	TC-23	684-003	Output Plate Bypass
8	.004	600	UCC-038	DT6D4	TP406	S-6-004	TC-25	684-004	Audio Coupling
9	.001	600	UCC-035	DT6D1	TP404	S-6-001	TC-21	684-001	Tone Compensation
10	.005	600	UCC-039	DT6D5	TP405	S-6-005	TC-25	684-005	Audio Coupling
11	.02	600	UCC-041	DT6S2	TP412	S-6-02	TC-12	684-02	" "
12	.05	200	UCC-011	DT4S5	TP426	S-4-05	TC-15	484-05	IF Grid
13	.005	600	UCC-039	DT6D5	TP405	S-6-005	TC-25	684-005	Osc. Feedback
14	.05	200	UCC-011	DT4S5	TP426	S-4-05	TC-15	484-05	AVC Filter
15	.05	400	UCC-028	DT4S5	TP426	MPW-4-05	TC-15	484-05	RF Bypass Pwr. Supp.
16	.05	200	UCC-011	DT4S5	TP426	S-4-05	TC-15	484-05	AVC Filter
17	100	50	UCU-1028	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	AF Plate Bypass
18	3600	300	UCU-2065						Fixed Pad
19	47	500	UCU-1020	5W5Q5	MC225	MO.5-45	1FM-45	1468-00005	Osc. Grid Cap.
20	3.3	500	RCU-5000						RF Coupling
21	27	500	UCU-1014	5W5Q3	MC220	MO.5-425	MS-425	1468-000025	" "

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
22A	2 Meg.	1	RRC-5000	MK403	D13-139	M-66-Z	Volume Control
B	Shaft		Not Req.	Not Req.	E	Not Req.	Attach to 22A per instructions
23A	1 Meg.	1	RRC-5002		D13-137		Tone Control
B	Shaft		Not Req.		E		Attach to 23A per instructions
C	Switch		" "		41		" " " " "

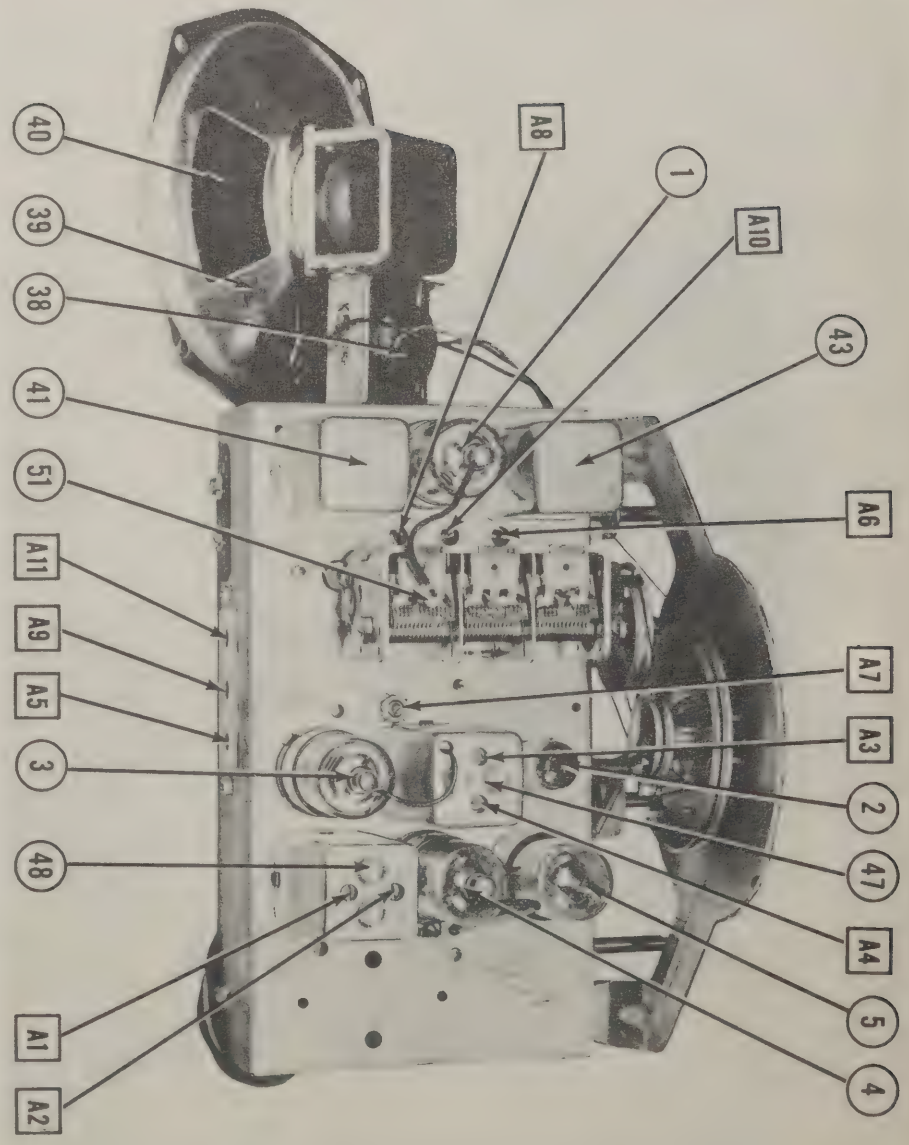
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
24	10KΩ	½	URD-073	BTS-10K	Br.-Blk.-Or. Antenna Loading
25	15KΩ	½	URD-077	BTS-15K	Br.-Grn.-Or. RF Coil Shunt
26	1 Meg.	½	URD-121	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
27	150Ω	½	URD-029	BW-½-150	Br.-Grn.-Br. Parasitic Suppressor
28	100KΩ	½	URD-097	BTS-100K	Br.-Blk.-Yl. Oscillator Grid
29	2200Ω	½	URD-057	BTS-2200	Red-Red-Red Parasitic Suppressor
30	100Ω	½	URD-025	BW-½-100	Br.-Blk.-Br. " "
31	10KΩ	½	URD-073	BTS-10K	Br.-Blk.-Or. Voltage Dropping
32	4.7 Meg.	½	URD-137	BTS-4.7 Meg.	Yl.-Vi.-Grn. IF Grid
33	3.3 Meg.	½	URD-133	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
34	470KΩ	½	URD-113	BTS-470K	Yl.-Vi.-Yl. Diode Load
35	10 Meg.	½	URD-145	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
36	1 Meg.	½	URD-121	BTS-1 Meg.	Br.-Blk.-Grn. AF Plate Load
37	330Ω	½	URD-037	BW-½-330	Or.-Or.-Br. Bias

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDARSON PART No.		INSTALLATION NOTES
38	6600Ω	3.5Ω	880Ω	.55Ω	RTO-5001	A-3878	T22S47		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: GENERAL ELECTRIC PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.		ST-108		
39	PM	3.5Ω	UOP-654	Mod. P6-X		
	CONE DIA.	VC DIA.				
40	6"	11/16"	UOX-011			

R F COILS

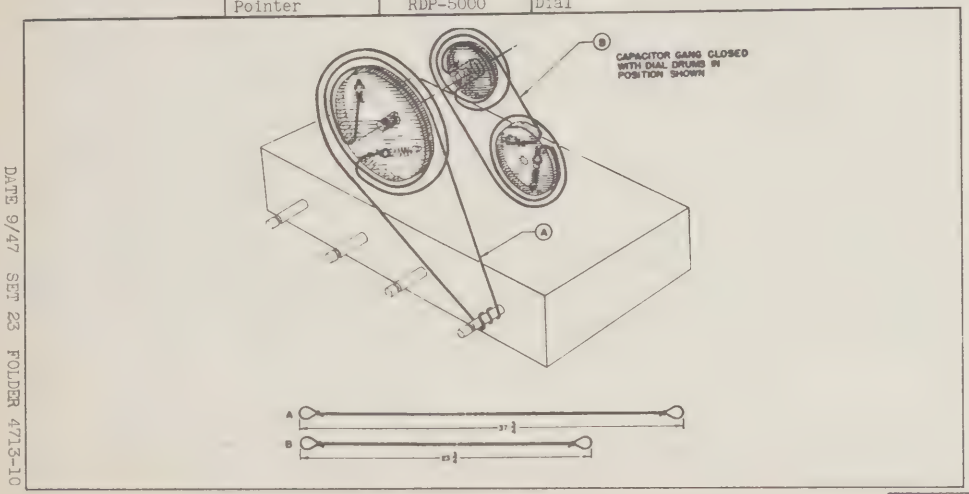
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	MEISSNER PART No.
41	BC Ant.Coil	77Ω	4Ω	RLA-5000	
42	SW " "	.2Ω	.1Ω	RLA-5002	
43	BC RF Coil	65Ω	3.8Ω	RLB-5000	
44	SW RF Coil		0Ω	RLB-5002	
45	SW Choke Coil		5Ω	RLI-5000	
46A	BC Osc.Coil	2.6Ω	6Ω	RLC-5000	
B	SW " "	.8Ω	0Ω	RLC-5000	
47	Input IF	13.5Ω	13.5Ω	RTL-5003	
48	Output IF	13Ω		RTL-5000	

BATTERIES

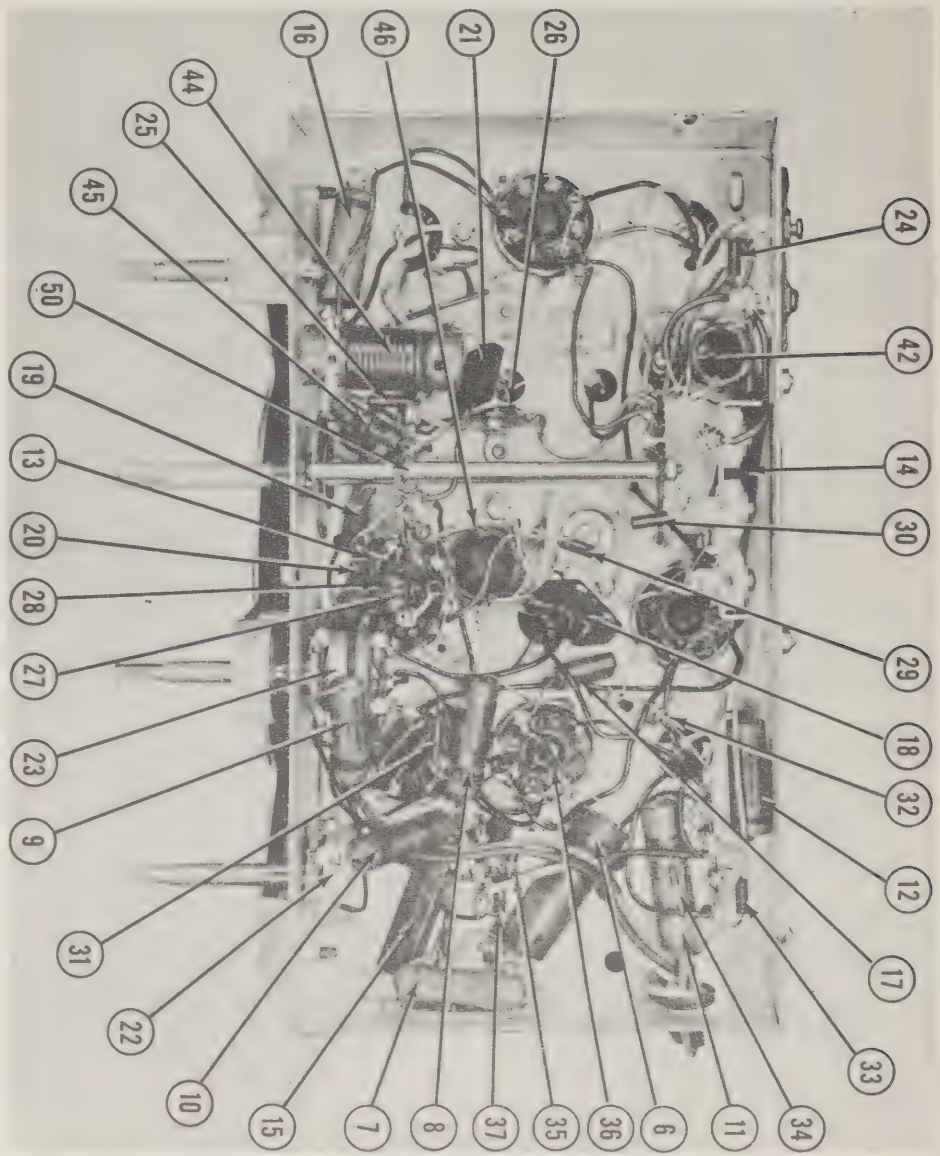
ITEM No.	VOLTAGE	GENERAL ELECTRIC PART No.	EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	INSTALLATION NOTES
49	1.5V "A"				#758	
50	90V "B"					

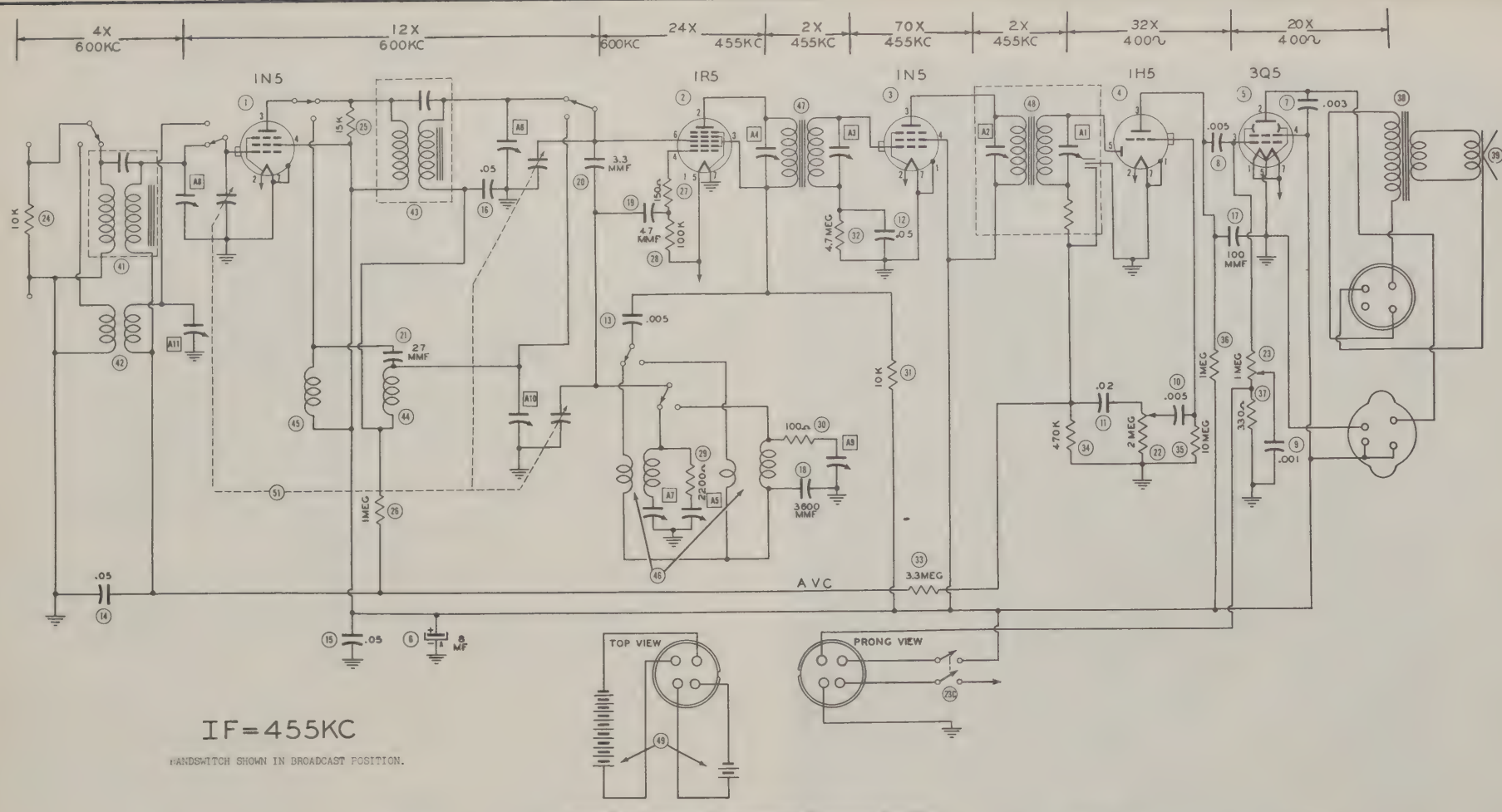
MISCELLANEOUS

ITEM No.	PART NAME	GENERAL ELECTRIC PART No.	NOTES
50	Band Switch	RSW-5000	
51	Tuning Cap.	RCT-5000	(12-435 MMF) each section
	Trimmer Assby.	RCY-5000	A6,A8, A10
A7	Trimmer Cap.	RCY-5001	BC Osc. Padder
	Knob	RDK-5000	Control
	Pointer	RDP-5000	Dial



CHASSIS—BOTTOM VIEW





IF=455KC

BANDSWITCH SHOWN IN BROADCAST POSITION.

VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	1N5GT	2V.	1.7VDC	87VDC	87VDC	0V.	0V.	0V.	0V.	0V.
2	1R5	0V.	.65VDC	.4VDC	-5.2VDC‡	0V.	0V.	1.4VDC	--	--
3	1N5GT	0V.	1.8VDC	87VDC	87VDC	0V.	0V.	0V.	0V.	0V.
4	1H5GT	0V.	1.7VDC	87VDC	0V.	0V.	0V.	0V.	87VDC	0V.
5	3Q5GT	0V.	1.7VDC	86VDC	87VDC	-.5VDC	90VDC	1.4VDC	0V.	--

‡TAKEN WITH VACUUM-TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	1N5GT	0Ω	*	170KΩ	170KΩ	INF.	INF.	0Ω	INF.	4.3 MEG.
2	1R5	0Ω	180KΩ	180KΩ	90KΩ	0Ω	5 MEG.	*	--	--
3	1N5GT	0Ω	*	170K.	170KΩ	1.4M.	INF.	0	INF.	4.5 MEG.
4	1H5GT	0Ω	*	1.2 MEG.	INF.	340KΩ	INF.	0Ω	170KΩ	10 MEG.
5	3Q5GT	0Ω	*	170K.	170KΩ	870KΩ	170K	*	0Ω	--

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

4713-10

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The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting to chassis.

1 - DC Voltage measurements are at 20,000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5 - Volume control at maximum, no signal applied for voltage measurements.

JEWEL
MODEL 300

JEWEL
MODEL 300

JEWEL MODEL 300

TRADE NAME	Jewel, Model 300
MANUFACTURER	Jewel Radio Corp., 583 Sixth Ave., New York 11, N.Y.
TYPE SET	AC-DC Operated Superheterodyne Receiver
TUBES (FOUR)	Types, 12SA7GT or 14Q7 Converter, 12SQ7GT or 14B6 Det.-AVC-AF, 50L6GT or 50A5 Power Output, 35Z5GT or 35Y4 Rectifier.
POWER SUPPLY	110-120 Volts AC-DC
TUNING RANGE—BROADCAST	540-1620KC RATING .285 Amps. @ 117V AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD. capacitor in series with low side of signal generator and chassis. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning cap. Low side to chassis.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2	200MMFD	High side to ext. ant. hank. Low side to chassis.	1620KC	"	"	A3	Adjust for maximum output.
3	200MMFD	"	1400KC	Tune for maximum output.	"	A4	" " " "

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PARTS LIST AND DESCRIPTIONS

JEWEL MODEL 300

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		JEWEL PART No.	STANDARD REPLACEMENT		
1A	Converter	12SA7GT	12SA7GT	8AD	
B	"	14Q7	14Q7	8AL	
2A	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
B	"	14B6	14B6	8W	
3A	Power Output	50L6GT	50L6GT	7AC	
B	"	50A5	50A5	6AA	
4A	Rectifier	35Z5GT	35Z5GT	6AD	
B	"	35Y4	35Y4	5AL	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	JEWEL PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	
5A	50	150	31-1	BRD3515	2N520	M-5030-150	TA-530	PRSA150-50-30	Filter - Red
B	30	150							" - Blue
6	.05	400	32-5	DT4S5	TP426	S-4-05	TC-15	484-05	Line Filter
7	.01	400	32-1	DT4S1	TP421	S-4-01	TC-11	484-01	Output Plate Bypass
8	.01	400	32-1	DT4S1	TP421	S-4-01	TC-11	484-01	Audio Coupling
9	.005	400		DT6D5	TP408	S-6-005	TC-25	484-005	" "
10	.05	200	32-4	DT4S5	TP426	S-4-05	TC-15	484-05	AVC Filter
11	.002	400	32-18	DT6D2	TP405	S-6-002	TC-22	484-002	Ant. Coupling
12	100	500	35-4	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Audio Plate Bypass
13	100	500	35-4	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Diode Filter

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	JEWEL PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
14A	2 Meg.	1	50-7	MR55	D13-139	M-66-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 14A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

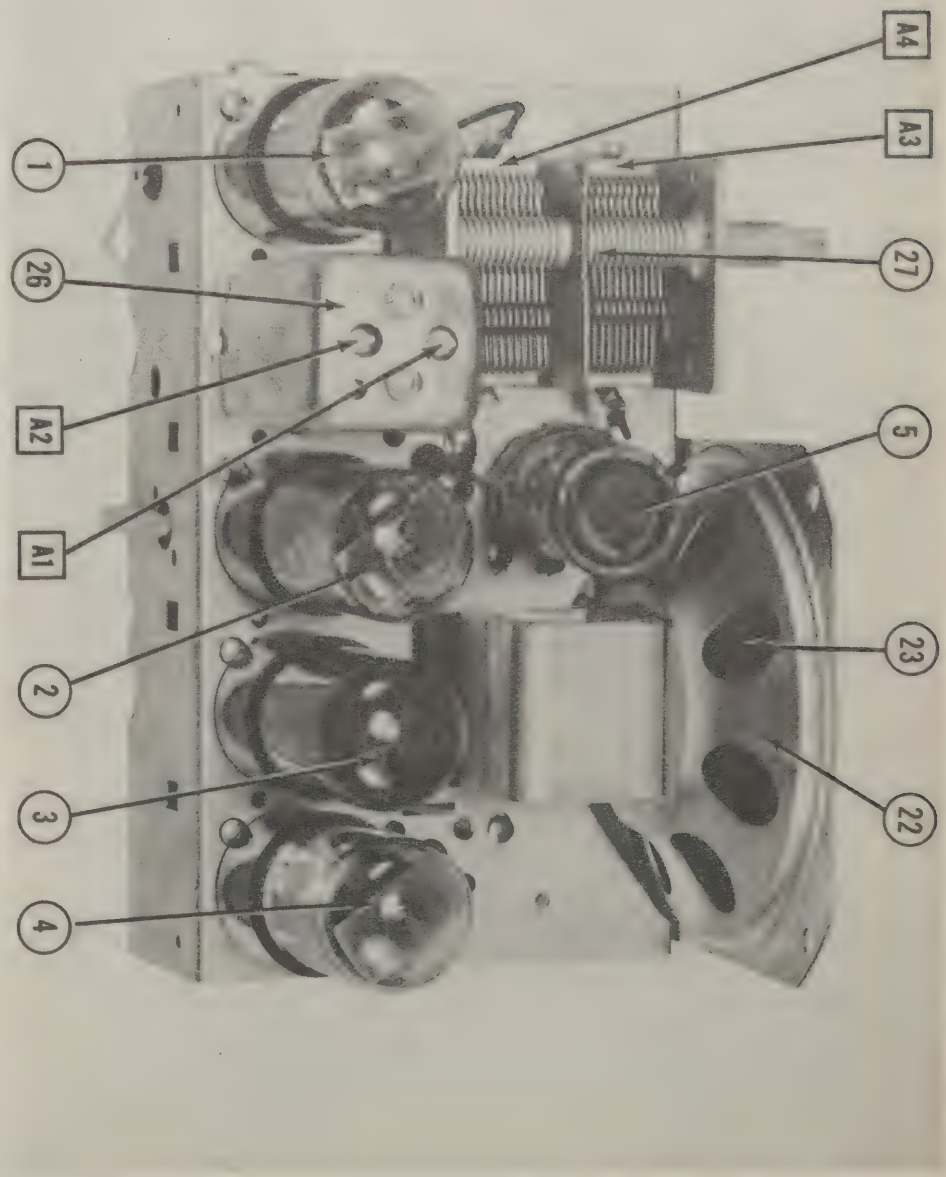
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	JEWEL PART No.	IRC PART No.	
15	8200Ω	½	20-42	BTS-8200	Gray-Red-Red Oscillator Grid
16	4.7 Meg.	½		BTS-4.7 Meg.	Yl.-Vi.-Grn. AVC Network
17	10 Meg.	½	20-8	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
18	500KΩ	½	20-5	BTS-470K	Grn.-Blk.-Yl. AF Plate Load
19	330KΩ	½	20-41	BTS-330K	Or.-Or.-Yl. Output Grid
20	2200Ω	2		BW-2-2200	Red-Red-Red Filter

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		JEWEL PART No.	STANCOR PART No.	THORDARSON PART No.		
	PRI.	SEC.	PRI.	SEC.					
21	1900Ω	3.7Ω	100Ω	.5Ω	91-4	A-3876	T22S45		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA JEWEL PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.		ST-113		
22	PM	3.7Ω	80-3	Mod. P4-X		
	CONE DIA.	VC DIA.				
23	4"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

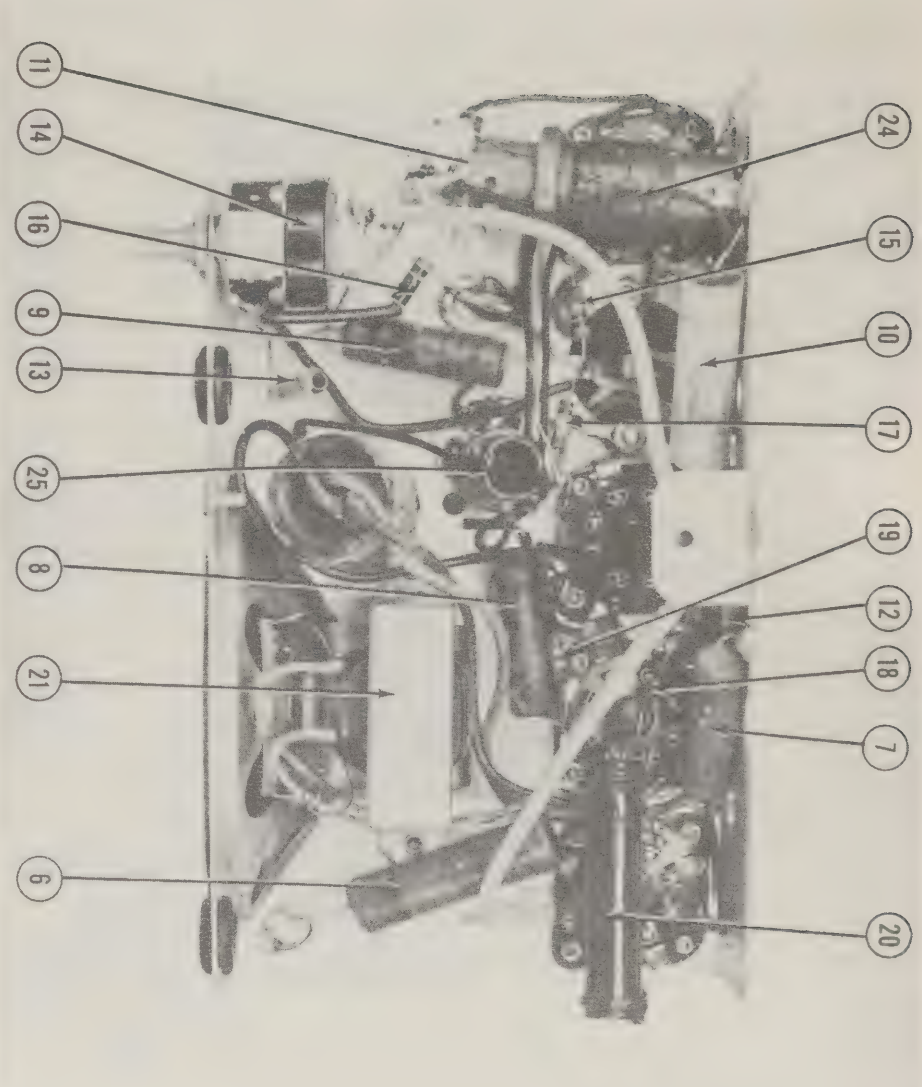
R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA JEWEL PART No.	MEISSNER PART No.	
24	Ant. Coil	25Ω	5Ω	62-3		
25	Osc. Coil	.8Ω	6Ω	60-2	14-1040	Add 50MMFD from grid to high side tuning cap.
26	IF Trans.	23Ω	24Ω	61-3		

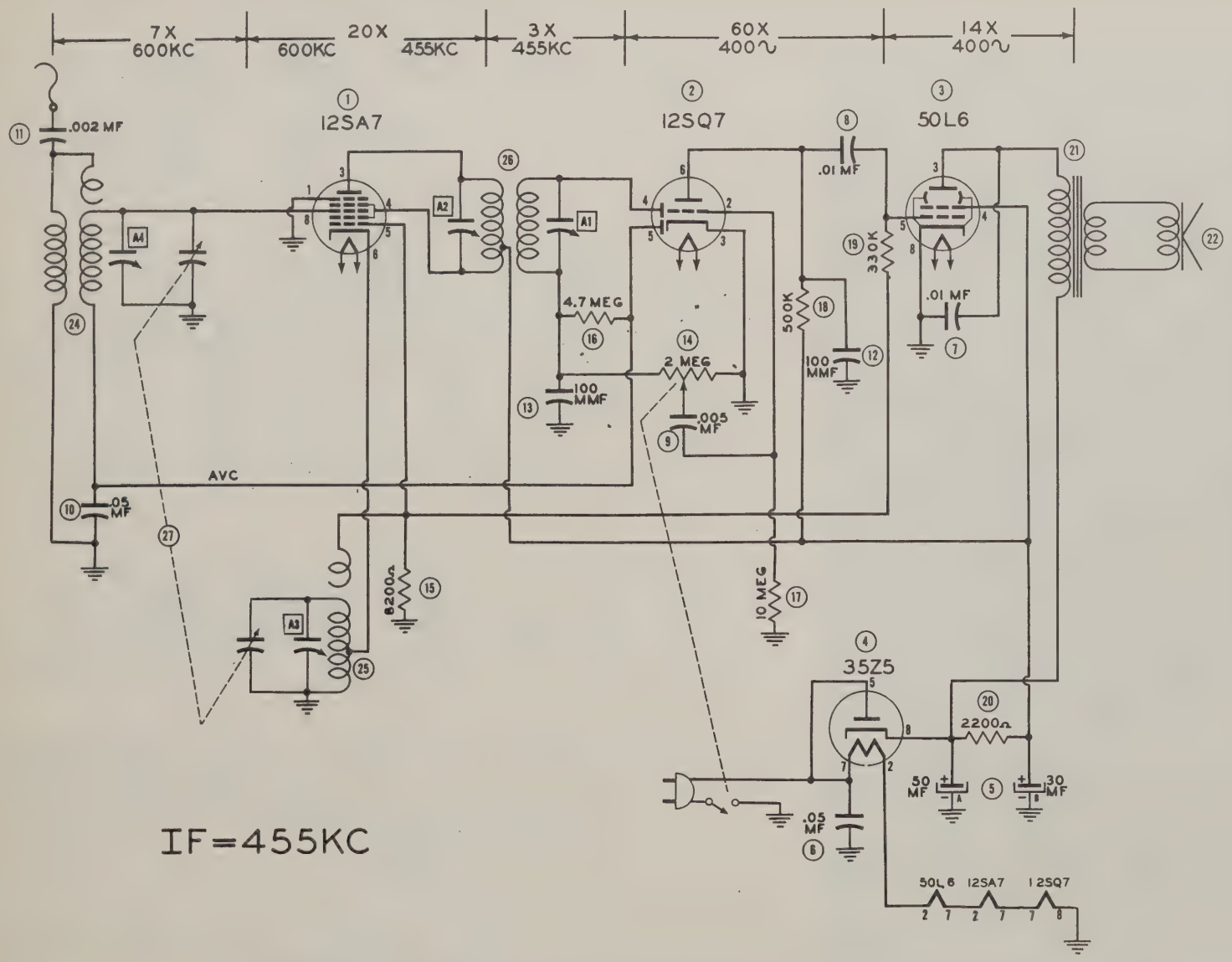
MISCELLANEOUS

ITEM No.	PART NAME	JEWEL PART No.	NOTES
27	Tuning Capacitor	30-4	(17-376 MMF, 30-183 MMF)
	Cabinet	120-13	
	Knob	122-8	
	Dial	123-4	

CHASSIS—BOTTOM VIEW



JEWEL MODEL 30A



Pin No.	12SA7GT Volt.	12SA7GT Res.	12SQ7GT Volt.	12SQ7GT Res.
1	0V.	0Ω	0V.	0Ω
2	27VAC	24Ω	-.8VDC	10 Meg.
3	93VDC	40KΩ	0V.	0Ω
4	93VDC	40KΩ	-.6VDC	2 Meg.
5	-6.8VDC§	8KΩ	-.7VDC	6 Meg.
6	0V.	.8Ω	58VDC	540KΩ
7	13VAC	12Ω	13VAC	12Ω
8	-.7VDC	6 Meg.	0V.	0Ω

Pin No.	50L6GT Volt.	50L6GT Res.	35Z5GT Volt.	35Z5GT Res.
1	0V.	INF	0V.	INF
2	82VAC	70Ω	82VAC	70Ω
3	125VDC	40KΩ	89VAC	80Ω
4	93VDC	40KΩ	130VDC	40KΩ
5	-1.3VDC	340KΩ	117VAC	102Ω
6	0V.	INF	0V.	INF
7	27VAC	24Ω	117VAC	102Ω
8	0V.	0Ω	130VDC	40KΩ

§TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

4713-11

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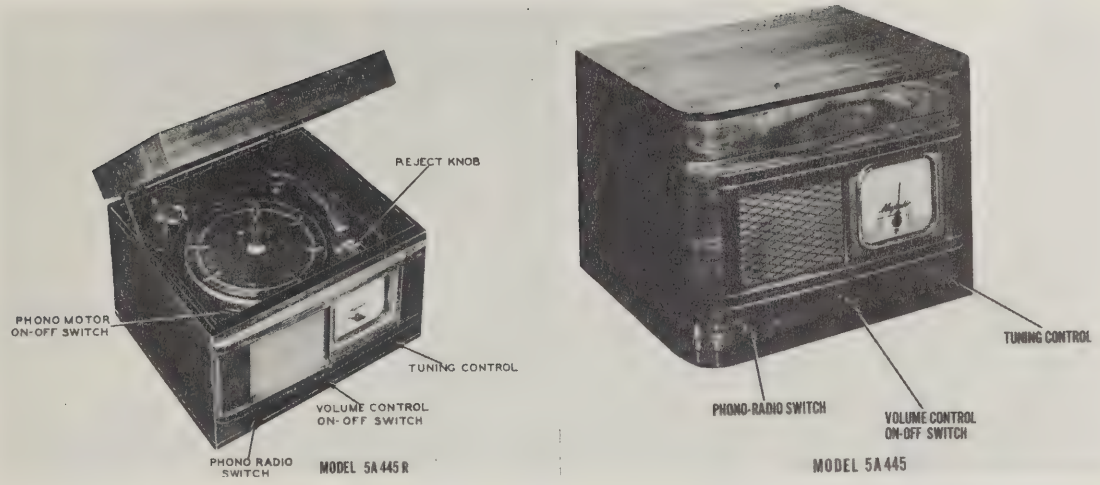
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

MAJESTIC
MODELS 5A445, 5A445R



MAJESTIC
MODELS 5A445, 5A445R

TRADE NAME	Majestic, Model 5A445, 5A445R
MANUFACTURER	Majestic Radio & Tel. Corp., St. Charles, Ill.
TYPE SET	AC Operated Phono-Radio Combination Superheterodyne with Loop Antenna
TUBES (FIVE)	Types, 12SA7 Converter, 12SK7 IF Amp., 12SQ7 Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	110-120 Volts AC
TUNING RANGE—BROADCAST	530-1650KC RATING .270 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial. Use isolation transformer if available. If not, connect a .1 MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01 MFD	High side to Pin 8 (grid) 12SA7. Low side to B-.	455KC	Any point of non-interference.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD. to reduce hum modulation. Repeat in reverse order.
2		Loop	1500KC	1500KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	"	Tune for maximum output.	"	A6	Rock tuning cap. and adjust for maximum output.

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DATE 9/47 SET 23 FOLDER 4713-12

PARTS LIST AND DESCRIPTIONS

MAJESTIC MODELS
5A445, 5A445R

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		MAJESTIC PART No.	STANDARD REPLACEMENT		
1	Converter	12SA7	12SA7	8R	
2	IF Amp.	12SK7	12SK7	8N	
3	Det.-AVC-AF	12SQ7	12SQ7	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MAJESTIC PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	
6A	40	150	19-24	BRD4215	2N514	M-4020-150	TA-240	PRSA150-40-20	Filter - Red
B	20	150							" - Blue
7	20	150	19-32	BR2015	TC45	M-20-150	UT-201	PRS150-20	"
8	.05	200	5-40	DT4S5	TP426	S-4-05	TC-15	484-05	Line Filter
9	.05	200	5-40	DT4S5	TP426	S-4-05	TC-15	484-05	Shield Isolation
10	.04	400	5-58	DT4S4	TP425	S-4-04	TC-14	484-04	Output Plate Bypass
11	.01	200	5-57	DT4S1	TP421	S-4-01	TC-11	484-01	Audio Coupling
12	.01	200	5-57	DT4S1	TP421	S-4-01	TC-11	484-01	Tone Compensation
13	.002	600	5-52	DT6D2	TP405	S-6-002	TC-22	684-002	Audio Coupling
14	.05	200	5-40	DT4S5	TP426	S-4-05	TC-15	484-05	AVC Filter
15	.05	200	5-40	DT4S5	TP426	S-4-05	TC-15	484-05	Line Isolation
16	.05	200	5-40	DT4S5	TP426	S-4-05	TC-15	484-05	Osc. Tun. Cap. Isol.
17	.01	200	5-57	DT4S1	TP421	S-4-01	TC-11	484-.01	Ext. Ant. Coupling
18	220	500	6-151	5W5T25	MC240	M0.5-322	1FM-325	1468-00025	Tone Compensation
19	220	500	6-151	5W5T25	MC240	M0.5-322	1FM-325	1468-00025	Audio Plate Bypass
20	220	500	6-151	5W5T25	MC240	M0.5-322	1FM-325	1468-00025	Diode Filter

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	MAJESTIC PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
21A	500KΩ	1	13-28	TM230	D13-133X	AT-78	Volume Control
B	Shaft		Not Req.	S825	E	KSS-3	Attach to 21A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

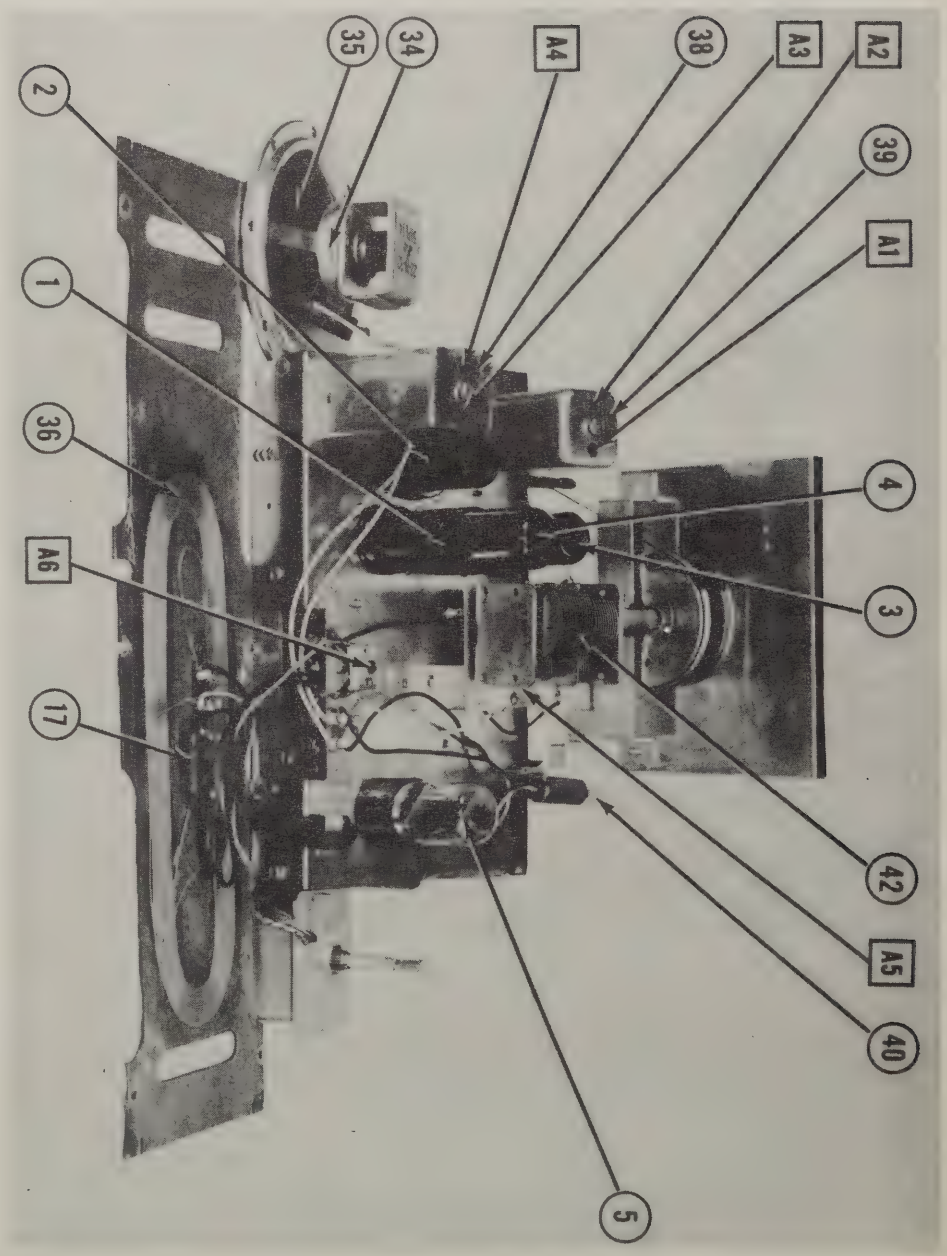
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MAJESTIC PART No.	IRC PART No.	
22	22KΩ	½	9-184	BTS-22K	Red-Red-Or. Oscillator Grid
23	220KΩ	½	9-182	BTS-220K	Red-Red-Yl. Line Isolation
24	2200Ω	½	02-100	BTS-2200	Red-Red-Red Screen Dropping
25	3.3 Meg.	½	9-206	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
26	22KΩ	½	9-184	BTS-22K	Red-Red-Or. Diode RF Filter
27	18KΩ	½	9-269	BTS-18K	Br.-Gray-Or. Tone Compensation
28	10 Meg.	½	9-160	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
29	330KΩ	½	9-89	BTS-330K	Or.-Or.-Yl. AF Plate Load
30	470KΩ	½	9-207	BTS-470K	Yl.-Vi.-Yl. Output Grid
31	150Ω	1	9-251	BW-1-150	Br.-Grn.-Br. Output Cathode
32	1200Ω	1	9-216	BTA-1200	Br.-Red-Red Filter

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MAJESTIC PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
33	2450Ω	3.3Ω	174Ω tapped @ 9Ω	.9Ω	12-20	A-3876*			*Add extra filter to reduce hum level.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: MAJESTIC PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA:	INSTALLATION NOTES
	FIELD	VC IMP.		ST-105		
34	PM	3.3Ω	22-32	Mod. P5-X		
	CONE DIA.	VC DIA.				
35	4"	1"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

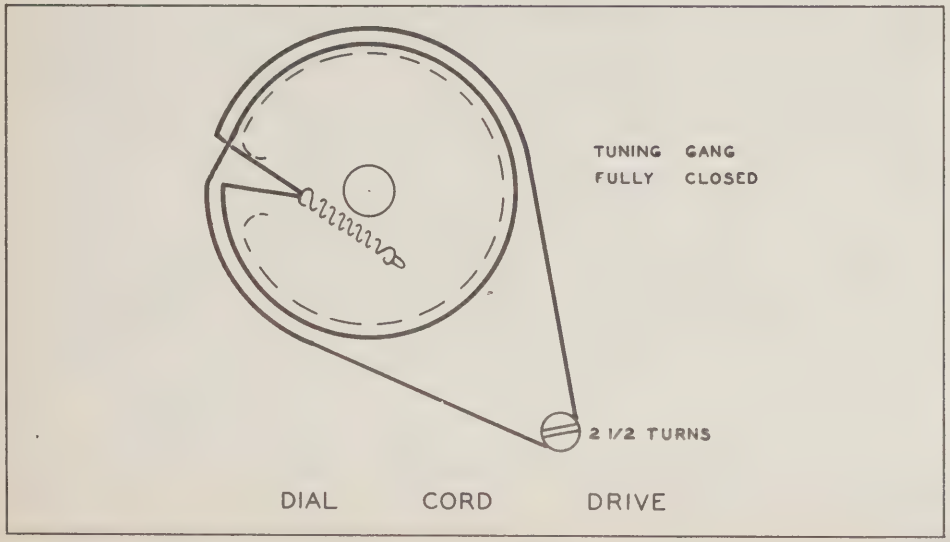
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MAJESTIC PART No.	REPLACEMENT DATA: MEISSNER PART No.	
36	Loop Ant.	.1Ω	1.8Ω	20-30		
37	Osc. Coil		6Ω	3-158	14-1040	Add 50 MMFD from grid to high side tuning cap.
38	Input IF	12Ω	12Ω	3-116	16-6658	
39	Output IF	12Ω	12Ω	3-117	16-6660	

DIAL LIGHT

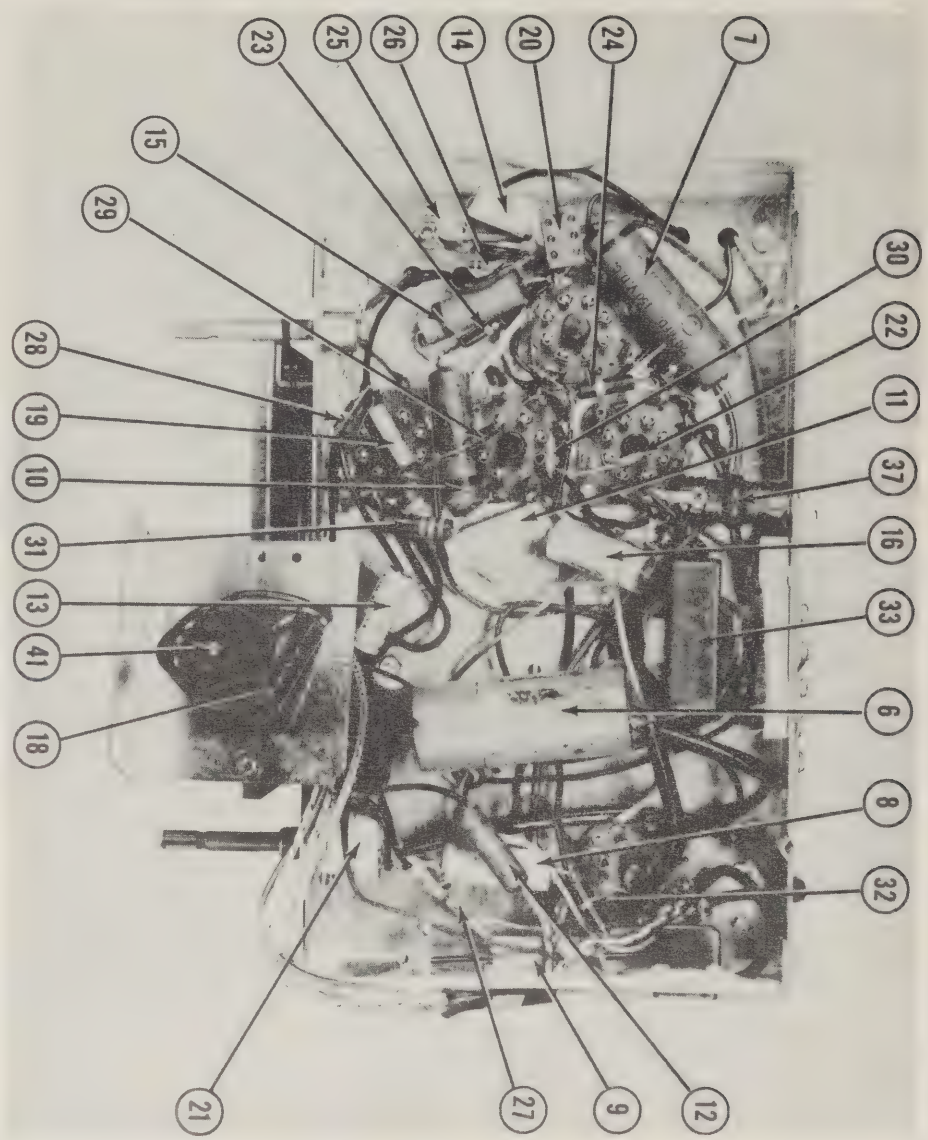
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: MAJESTIC PART No.	REPLACEMENT DATA:	INSTALLATION NOTES
40	Bayonet	6-8	0.15	Brown	26-2		Type 47

MISCELLANEOUS

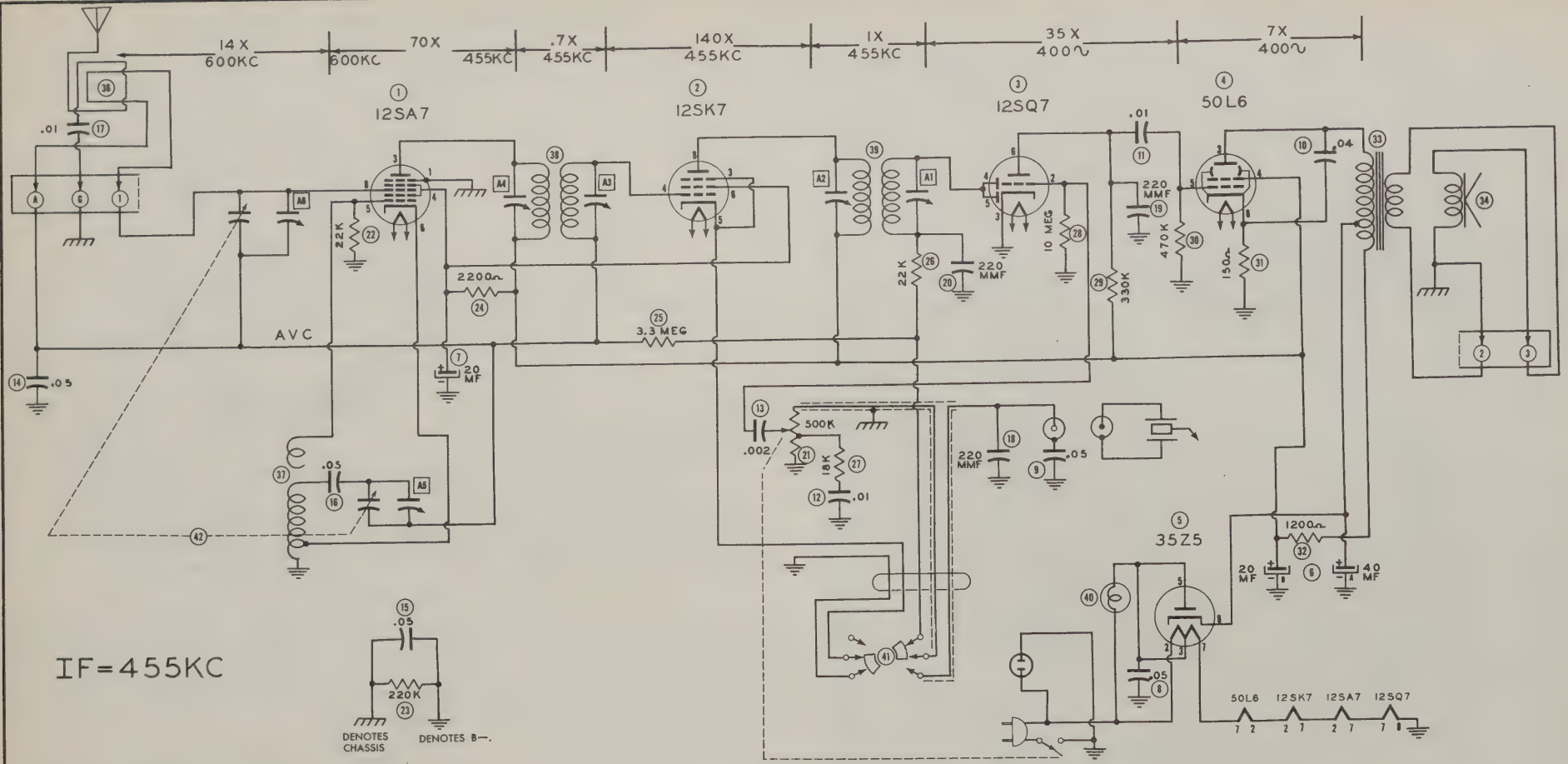
ITEM No.	PART NAME	MAJESTIC PART No.	NOTES
41	Switch	11-52	Radio-Phono
42	2 Gang Var. Cap.	7-24	16-447 MMF, 13-197 MMF
	Dial Scale	117-66	
	Dial Pointer	135-14	
	Cabinet	115-22	Model 5A445R
	"	115-18	Model 5A445



CHASSIS—BOTTOM VIEW



MAJESTIC MODELS 5A445, 5A445R



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	0V.	25VAC	92VDC	73VDC	-6VDC§	0V.	13VAC	-.2VDC
2	12SK7	0V.	37VAC	0V.	-.2VDC	0V.	73VDC	25VAC	92VDC
3	12SQ7	0V.	-.6VDC	0V.	-.6VDC	-.6VDC	57VDC	13VAC	0V.
4	50L6GT	0V.	37VAC	111VDC	92VDC	0V.	0V.	87VAC	6.6VDC
5	35Z5GT	0V.	117VAC	112VAC	92VDC	112VAC	118VDC	87VAC	118VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	230KΩ	25Ω	100KΩ	100KΩ	20KΩ	.7Ω	13Ω	4 Meg.
2	12SK7	230KΩ	37Ω	0Ω	4 Meg.	0Ω	100KΩ	25Ω	100KΩ
3	12SQ7	230KΩ	10 Meg.	0Ω	580KΩ	580KΩ	430KΩ	13Ω	0Ω
4	50L6GT	230KΩ	37Ω	100KΩ	100KΩ	500KΩ	0Ω	85Ω	140Ω
5	35Z5GT	1MF	112Ω	110Ω	100KΩ	110Ω	100KΩ	85Ω	100KΩ

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RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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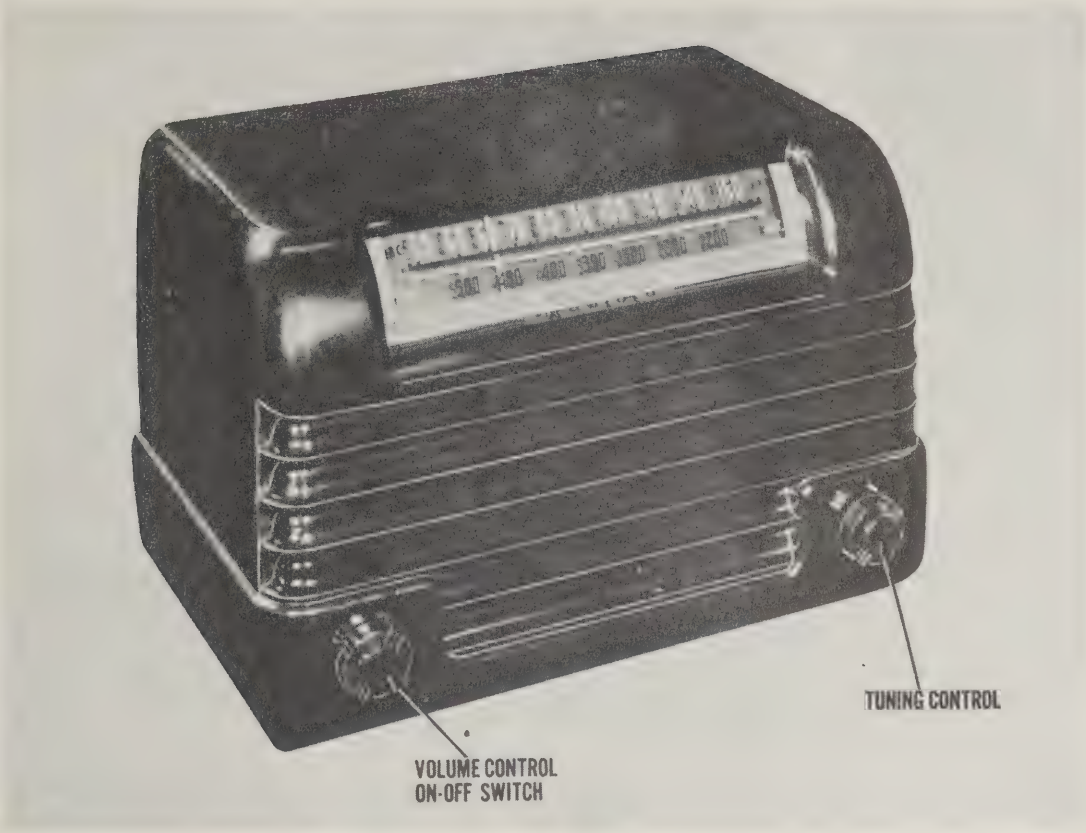
1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

MANTOLA
MODELS R 664-PM, R 664-PV, R 664-W



MANTOLA
MODELS R 664-PM, R 664-PV, R 664-W

MANTOLA MODEL R664-PV

TRADE NAME	Mantola, Models R664-PM, R664-PV, R664-W
SUPPLIER	The B. F. Goodrich Co., 500 South Main St., Akron, Ohio
TYPE SET	AC-DC Superheterodyne with Loop Antenna
TUBES (SIX)	Types, 12SJ7 RF Amp., 12SA7 Converter, 12SK7 IF Amp., 12SQ7GT, Det.-AVC-AF, 35L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	110-120 Volts AC-DC
TUNING RANGE—BROADCAST	540-1630KC RATING .240 Amps. @ 117 V. AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If position of dial drum has been disturbed, turn tuning capacitor fully closed and set the drum so that a straight line drawn through the center of the drum and the dial cable hole on the drum is parallel to the chassis base. If tuning coil slug (A6) is replaced or needs repositioning, set dial drum to proper position and adjust A6 so that the top of the slug is flush with top of RF coil form (46).
To set pointer turn tuning cap. fully closed and set left edge of dial pointer saddle to 1st hole on left end of dial backplate. Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	250MMFD	High side to Pin 8 (grid) 12SA7. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
2	250MMFD	High side to ext. ant. lead. Low side to chassis.	1630KC	"	"	A5	" " " "
3	250MMFD	"	1400KC	Tune for maximum output.	"	A6	" " " "
4		Loop	1400KC	"	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

MANTOLA MODELS
R664-FM, R664-PV, R664-W

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MANTOLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	12SJ7	12SJ7	8N	
2	Converter	12SA7	12SA7	8R	
3	IF Amp.	12SK7	12SK7	8N	
4	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
5	Power Output	35L6GT	35L6GT	7AC	
6	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MANTOLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	30	150	67A8	EZ42215	TN129	DSB-40-3020-150	TA-303	PRSA150-30-30	Filter - Yellow ‡
B	30	150							" - Red
C	20	150						PRS150-20	" - Blue
8	.05	400	64B1-22	DT4S5	TP426	S-4-05	TC-15	484-05	Line Filter
9	.2	400	64A2-1	DT4P2	TP429	S-4-2	TC-2	484-.2	Line Isolation
10	.02	400	64B1-24	DT4S2	TP423	S-4-02	TC-12	484-02	Output Plate Bypass
11	.01	400	64B1-25	DT4S1	TP421	S-4-01	TC-11	484-01	Audio Coupling
12	.01	400	64B1-25	DT4S1	TP421	S-4-01	TC-11	484-01	" "
13	.01	400	64B1-25	DT4S1	TP421	S-4-01	TC-11	484-01	Tone Compensation*
14	.01	400	64B1-25	DT4S1	TP421	S-4-01	TC-11	484-01	" " *
15	.02	400	64B1-24	DT4S2	TP423	S-4-02	TC-12	484-02	Osc. Tun. Cap. Isolation
16	.05	400	64B1-22	DT4S5	TP426	S-4-05	TC-15	484-05	RF Decoupling
17	.1	200	64B1-30	DT4P1	TP428	S-4-1	TC-1	484-01	AVC Filter
18	.005	600	64B1-12	DT6D5	TP408	S-6-005	TC-25	684-005	Ext. Ant. Coupling
19	500	500	65B7-27	5W5T5	MC245	M0.5-35	1FM-35	1468-0005	Audio Plate Bypass
20	250	500	65B7-22	5W5T25	MC240	M0.5-325	1FM-325	1468-00025	Diode Filter
21	50	500	65B7-11	5W5Q5	MC225	M0.5-45	1FM-45	1468-00005	Osc. Grid Capacitor
22	20	500	65B5-5	5W5Q2					Fixed Trimmer
23	250	500	65B7-22	5W5T25	MC240	M0.5-325	1FM-325	1468-00025	RF Coupling
24	785	500	64A2-1						Fixed Trimmer

*Not used in all models.
‡Some models may use a 50-30 MFD filter.

CONTROLS

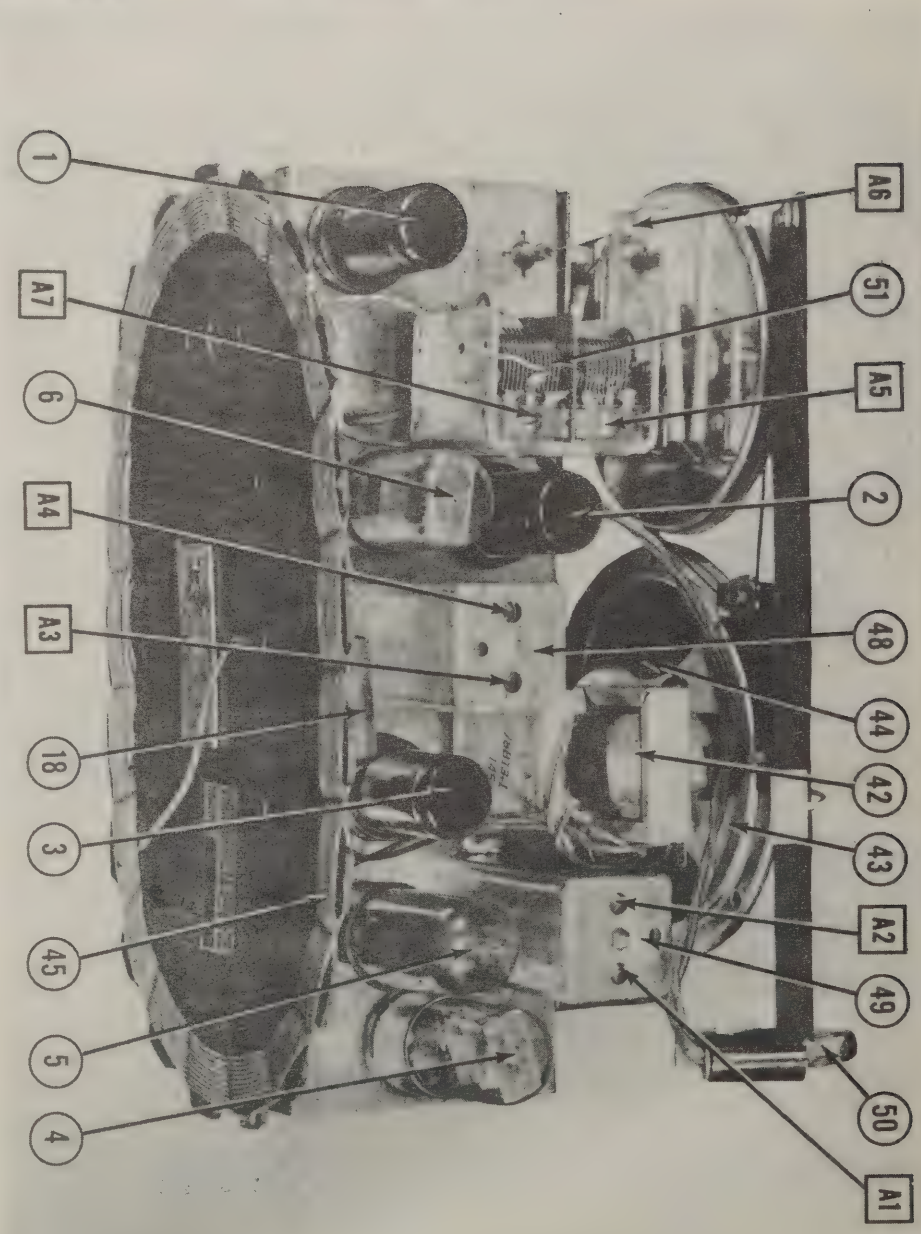
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MANTOLA PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
25A	500KΩ	1	75B3-2	MK401	D13-133	AM-60-Z	Volume Control-See Note 1
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 25A per instructions.
C	Switch		" "	M26	41	SW-A	" " " " "
25A	500KΩ	1	75B3-2	DTM283	D18-133XX	AT-92	Volume Control-See Note 2
B	Shaft		Not Req.	SS25	E	KSS-3	Attach to 25A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

Note 1 - Use this replacement when original has no tone taps.
Note 2 - Use this replacement when original has two tone taps.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MANTOLA PART No.	IRC PART No.	IDENTIFICATION CODES
26	10KΩ	½	60B8-103	BTS-10K	Br.-Blk.-Or. Converter Grid
27	10 Meg.	½	60B8-106	BTS-10 Meg.	Br.-Blk.-Blue AVC Network
28	22KΩ	½	60B8-223	BTS-22K	Red-Red-Or. Oscillator Grid
29	100KΩ	½	60B8-101	BW-½-100	Br.-Blk.-Br. RF Decoupling
30	1 Meg.	½	60B8-105	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
31	47KΩ	½	60B8-473	BTS-47K	Yl.-Vi.-Or. Tone Compensation-See Note 3
32	27KΩ	½	60B8-273	BTS-27K	Red-Vi.-Or. Tone Compensation-See Note 3
33	5 Meg.	½	60B8-505	BTS-4.7 Meg.	Grn.-Blk.-Grn. AF Grid
34	270KΩ	½	60B8-274	BTS-270K	Red-Vi.-Yl. AF Plate Load

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MANTOLA PART No.	IRC PART No.	
35	470KΩ	½	60B8-474	BTS-470K	Yl.-V1.-Yl. Output Grid
36	150Ω	½	60B8-151	BW-½-150	Br.-Grn.-Br. Output Cathode
37	150KΩ	½	60B8-154	BTS-150K	Br.-Grn.-Yl. Line Isolation
38	1000Ω	1		BTA-1000	Br.-Blk.-Red Filter - See Note 4
39	150Ω	1		BW-1-150	Br.-Grn.-Br. Filter - See Note 4
40	33Ω	1		BW-1-33	Or.-Or.-Br. Surge Limiter-See Note 4

Note 3-Not used in all models.
Note 4-Not used in models using filter choke.

FILTER CHOKE

ITEM NO.	RATINGS			REPLACEMENT DATA			INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	MANTOLA PART NO.	STANCOR PART NO.	THORDARSON PART NO.	
41	.067A	319Ω	3.6 Henries	74A1	C-1711	T20C52	Not used in models using Items 35, 36 and 37.

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MANTOLA PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
42A	2700Ω	3.1Ω	175Ω	.6Ω	Part of 78B13-1	A-3876§	T22S45§		§Bend mounting tabs down, file out slots and mount on original bracket.
B					Part of 78B4-2				Used with Alternate Speaker.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
	FIELD	VC IMP.	MANTOLA PART No.	JENSEN PART No.		
43A	PM	3.1Ω	78B13-1	ST-107†		†Drill and tap magnet frame.
B			78B4-2	Mod. P5-V		Alternate Speaker
	CONE DIA.	VC DIA.				
44	4-3/4"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MANTOLA PART No.	MEISSNER PART No.	
45	Loop Ant.	0Ω	1Ω	89B4		
46	RF Coil		2Ω	A-1052		
47	Osc. Coil		5Ω	69A5	14-1040	
48	Input IF	18Ω	18Ω	72B3	16-6658	
49	Output IF	21Ω	22Ω	72B4	16-6660	

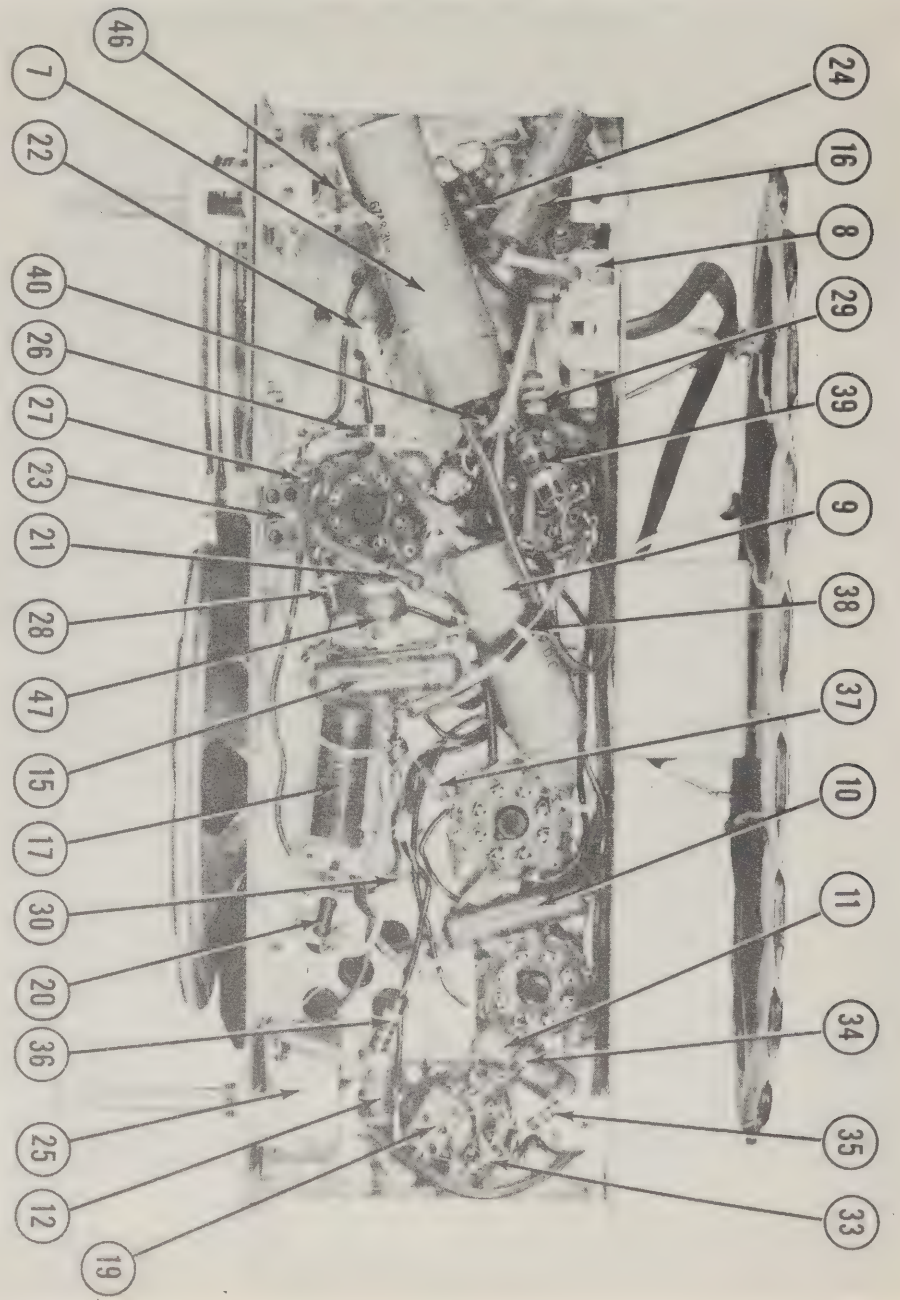
DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					MANTOLA PART No.		
50	Bayonet	6-8	0.15	Brown	81A1-3		Type 47

MISCELLANEOUS

ITEM No.	PART NAME	MANTOLA PART No.	NOTES
51	Tuning Capacitor	68A2	(22-495 MMF, 18-204 MMF)
	Cabinet	34D8-1	Plastic Ivory
	"	34D8-2	" Mahogany
	Knob	33A7-1	Ivory
	"	33A7-2	Mahogany
	"	33A7-5	Wood
	Pointer	25A13-1	
	Dial Scale	21P10-1	Glass

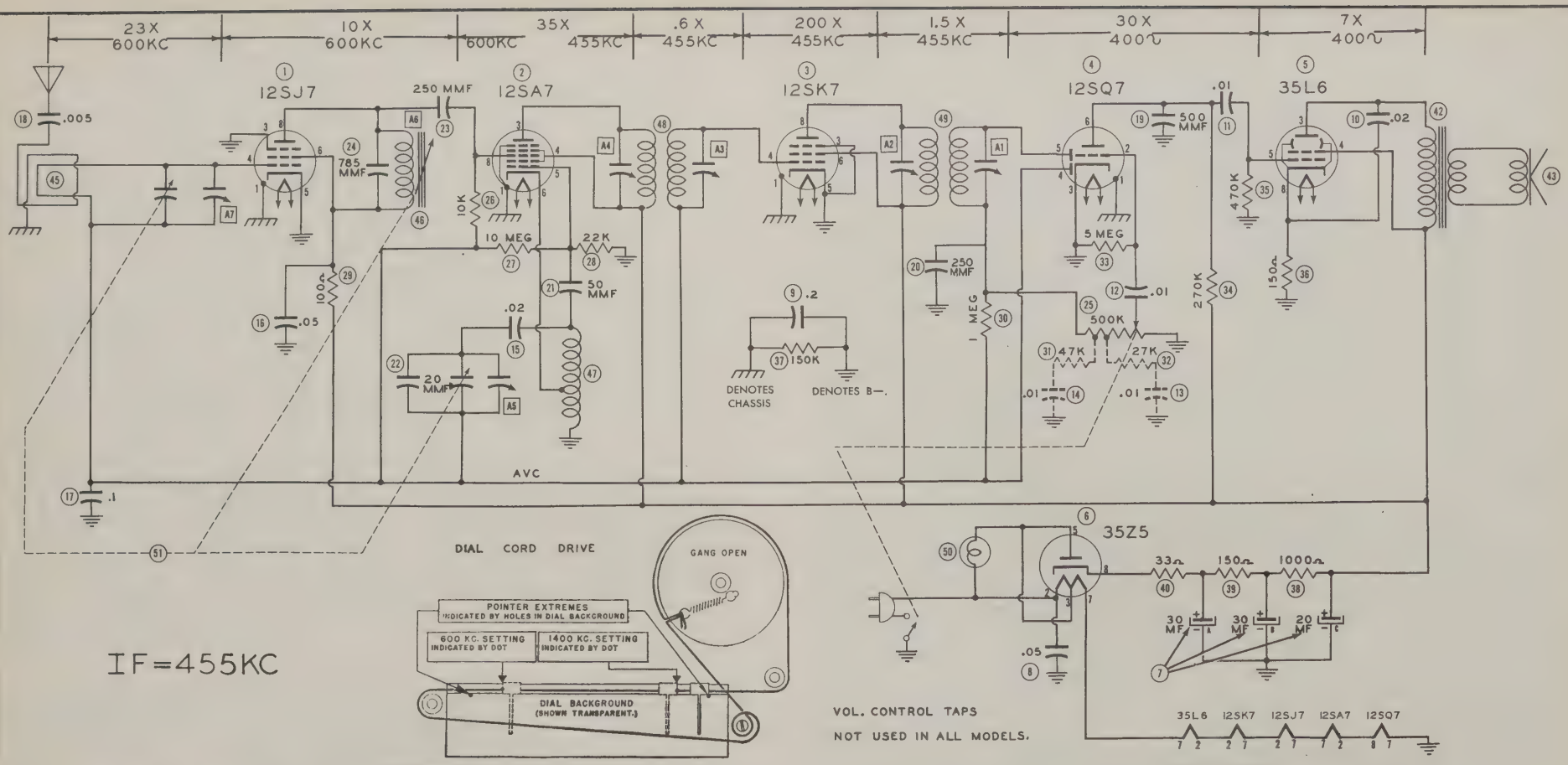
CHASSIS—BOTTOM VIEW



DATE 9/47 SET 23 FOLDER 4713-13

MANTOLA MODELS
R664-PM, R664-PV, R664-W

MANTOLA MODELS
R664-PM, R664-PV, R664-W



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SJ7	0V.	38VAC	0V.	-.7VDC	0V.	78VDC	25VAC	78VDC
2	12SA7	0V.	12VAC	76VDC	78VDC	-8VDC$	0V.	25VAC	-.7VDC
3	12SK7	0V.	48VAC	0V.	-.7VDC	0V.	78VDC	38VAC	78VDC
4	12SQ7GT	0V.	-1VDC	0V.	-.7VDC	-.7VDC	53VDC	0V.	12VAC
5	35L6GT	0V.	46VAC	92VDC	78VDC	0V.	0V.	87VAC	4.9VDC
6	35Z5GT	78VDC	117VAC	112VAC	105VDC	112VAC	113VDC	87VAC	115VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SJ7	170KΩ	38Ω	0Ω	1.4 Meg.	0Ω	60KΩ	25Ω	60KΩ
2	12SA7	170KΩ	12Ω	60KΩ	60KΩ	22KΩ	.6Ω	25Ω	1.4 Meg.
3	12SK7	170KΩ	50Ω	0Ω	1.4 Meg.	0Ω	60KΩ	38Ω	60KΩ
4	12SQ7GT	170KΩ	5 Meg.	0Ω	1.4 Meg.	510KΩ	330KΩ	0Ω	12Ω
5	35L6GT	INF	50Ω	60KΩ	60KΩ	480KΩ	INF	85Ω	150Ω
6	35Z5GT	60KΩ	112Ω	110Ω	60KΩ	110Ω	60KΩ	85Ω	60KΩ

$TAKEN WITH VACUUM TUBE VOLTMETER.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

4713-13

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The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

PHOTOFACT* Folder

*TRADE MARK

MINERVA
MODELS 729 (PORTAPAL)
(BATTERY OPERATED)

MINERVA
MODELS 729 (PORTAPAL)
(BATTERY OPERATED)

MINERVA
MODELS 729 (PORTAPAL)
(BATTERY OPERATED)

MINERVA MODEL 729

TRADE NAME	Minerva Portapal Model 729
MANUFACTURER	Minerva Corp. of America, 238 William St., New York, N.Y.
TYPE SET	Three Power Portable Superheterodyne with Self Contained Loop Antenna
TUBES (FIVE)	Types, 1R5 Converter, 1T4 IF Amp., 1S5 Det.-AVC-AF, 3Q4 Power Output, 117Z3 Rectifier.
POWER SUPPLY RATING	105-125 Volts AC-DC or 9 Volt "A" Supply and 90 Volt "B" Supply .150 Amps. @ 117V AC or 49MA @ 9 Volts DC and 16MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540-1640KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power when available. If AC power is used, use an isolation transformer when available If not, connect a .1 MFD capacitor in series with low side of the signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning cap. Low side to chassis.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If AC power is used without an isolation, transformer reduce dummy ant. to 200 MMF to reduce hum modulation.
2	200MMFD	High side to ext. ant. lead. Low side to chassis.	1640KC	"	"	A5	Adjust for maximum output.
3	200MMFD	"	1400KC	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

MINERVA PORTAPAL
MODEL 720

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MINERVA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	312074	1R5	7AT	
2	IF Amp.	312077	1T4	6AR	
3	Det.-AVC-AF	312076	1S5	6AU	
4	Power Output	312072	3Q4	7BA	
5	Rectifier	312128	117Z3	4BR	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MINERVA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	40	150	230005			DY3x40-150	EL-340	AF888D	Filter - Red
B	40	150							" - "
C	40	150							" - Yellow
D	100	25				M-100-25	UHC-102	PRS25-100	Filament Bypass-Yel.
7	.05	200	190004	DT4S5	TP426	S-4-05	TC-15	484-05	Line Filter
8	.1	200	190039	DT4P1	TP428	S-4-1	TC-1	484-.1	RF Bypass Pwr. Supp.
9	.005	200	190042	DT6D5	TP408	S-6-005	TC-25	484-005	Output Plate Bypass
10	.01	200	190038	DT4S1	TP421	S-4-01	TC-11	484-01	Audio Coupling
11	.1	200	190039	DT4P1	TP428	S-4-1	TC-1	484-.1	Audio Screen Bypass
12	.01	200	190038	DT4S1	TP421	S-4-01	TC-11	484-01	Audio Coupling
13	.05	200	190007	DT4S5	TP426	S-4-05	TC-15	484-05	AVC Filter
14	.1	200	190039	DT4P1	TP428	S-4-1	TC-1	484-.1	Filament Bypass
15	.01	200	190038	DT4S1	TP421	S-4-01	TC-11	484-01	Ext. Ant. Coupling
16	250	500	212027	5W5T25	MC240	MO.5-325	1FM-325	1468-00025	Audio Plate Bypass
17	200	500	212027	5W5T2	MC237	MO.5-32	1FM-32	1468-0002	Diode Filter
18	50	500	212015	5W5Q5	MC225	MO.5-45	1FM-45	1468-00005	Osc. Grid Capacitor

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MINERVA PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
19A	500KΩ	1	300014	MR48	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 19A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

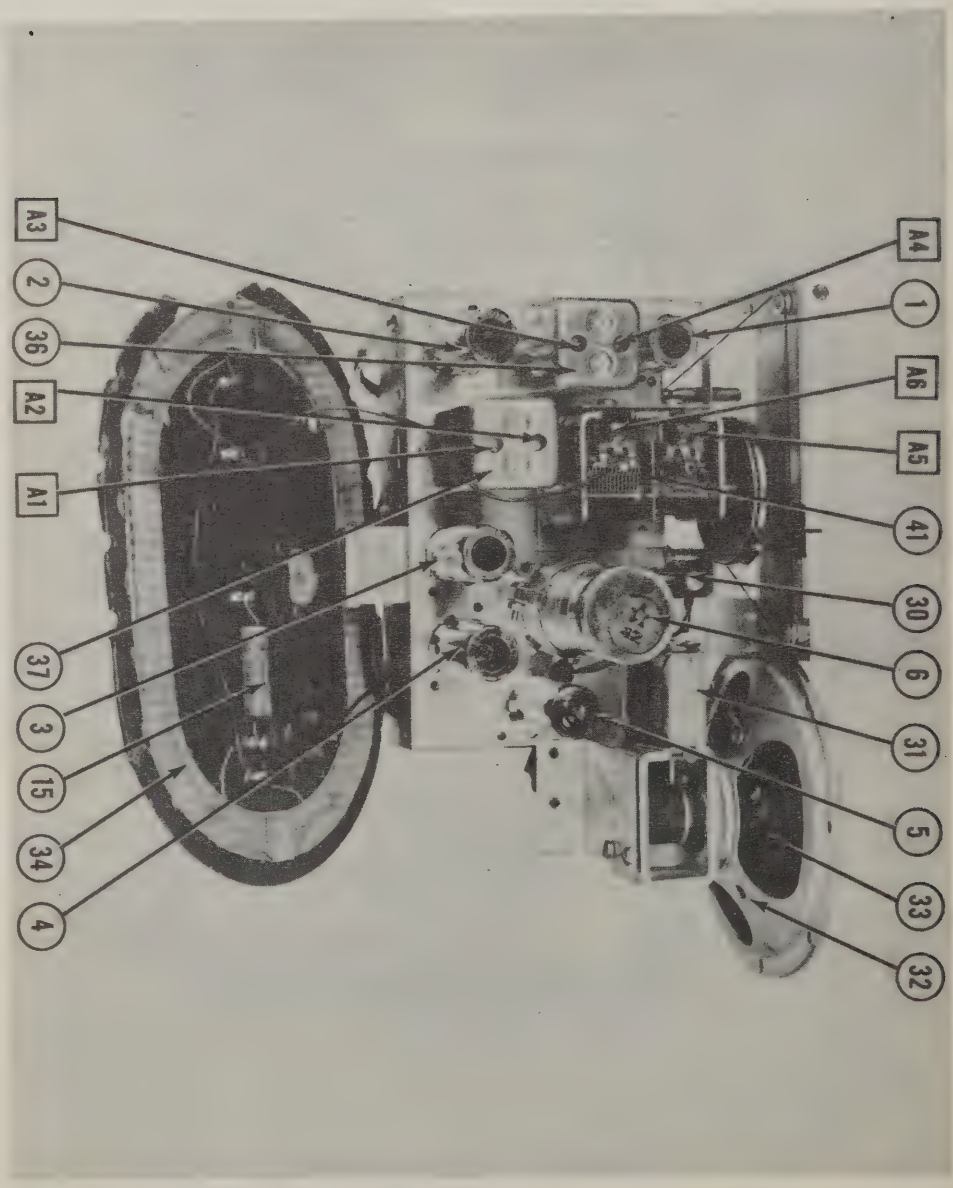
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MINERVA PART No.	IRC PART No.	IDENTIFICATION CODES
20	100KΩ	½	272104	BTS-100K	Br.-Blk.-Yl. Oscillator Grid
21	2.2 Meg.	½	272225	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
22	10 Meg.	½	272106	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
23	3 Meg.	½	272305	BTS-3.3 Meg.	Or.-Blk.-Grn. AF Screen Dropping
24	1 Meg.	½	272105	BTS-1 Meg.	Br.-Blk.-Grn. AF Plate Load
25	470KΩ	½	272474	BTS-470K	Yl.-Vl.-Yl. Output Grid
26	270Ω	½	272271	BW-½-270	Red-Vl.-Br. Filament String
27	1000Ω	½	272102	BTS-1000	Br.-Blk.-Red Filament String
28	33Ω	1		BW-1-33	Or.-Or.-Blk. Series "A" Battery
29	33Ω	1		BW-1-33	Or.-Or.-Blk. Rectifier Ballast
30A	700Ω	10	303013	ABA-2250	Filter-See Note
B	1550Ω				Filament String

Note-On IRC replacement set slider at 1550Ω from one end.

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MINERVA PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
31	7700Ω	2.8Ω	670Ω	.4Ω		A-3878*	T22S47*		*Bend mounting tabs down, file out slots and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA MINERVA PART No.	JENSEN PART No.		INSTALLATION NOTES
32	FIELD PM	VC IMP. 2.8Ω	53C-17	ST-105† Mod. P5-X		†Drill and tap magnet frame.
33	CONE DIA. 4-3/4"	VC DIA. 1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

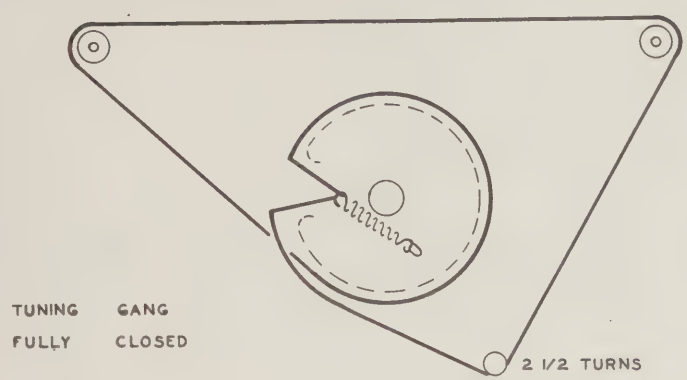
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MINERVA PART No.	REPLACEMENT DATA MEISSNER PART No.
34	Loop Ant.	.1Ω	3Ω	247001	
35	Osc. Coil	1Ω	4.5Ω	248009	14-1040
36	Input IF	21Ω	21Ω	305002	16-6662
37	Output IF	21Ω	20Ω	305003	16-6663

BATTERIES

ITEM No.	VOLTAGE	MINERVA PART No.	EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	INSTALLATION NOTES
38	4½ V. "A"	372001	(2)#746			2 Used in Series
39	45 V. "B"	372002		(2)#482		" " " "

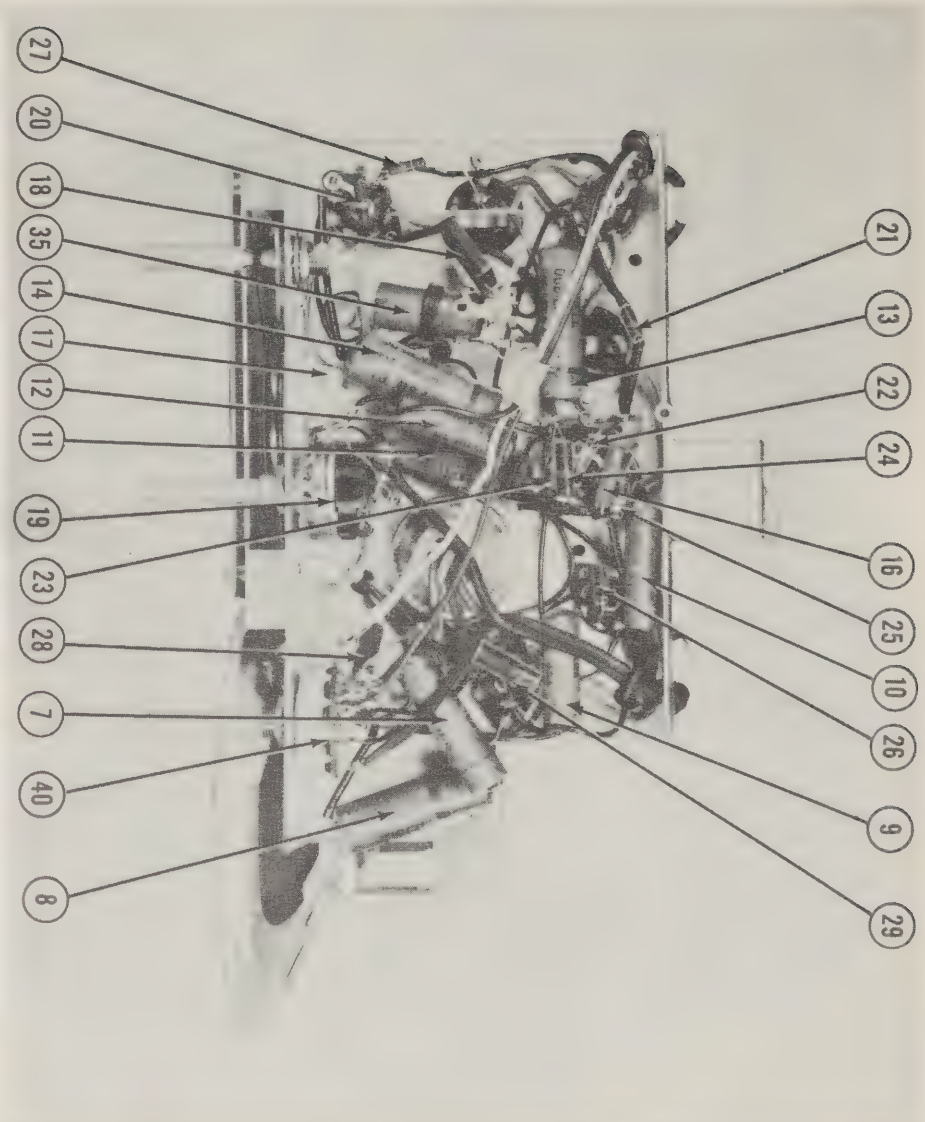
MISCELLANEOUS

ITEM No.	PART NAME	MINERVA PART No.	NOTES
40	Switch	255002	Power Change-Over
41	Tuning Capacitor	235003	(39-412 MMF, 31-182 MMF)

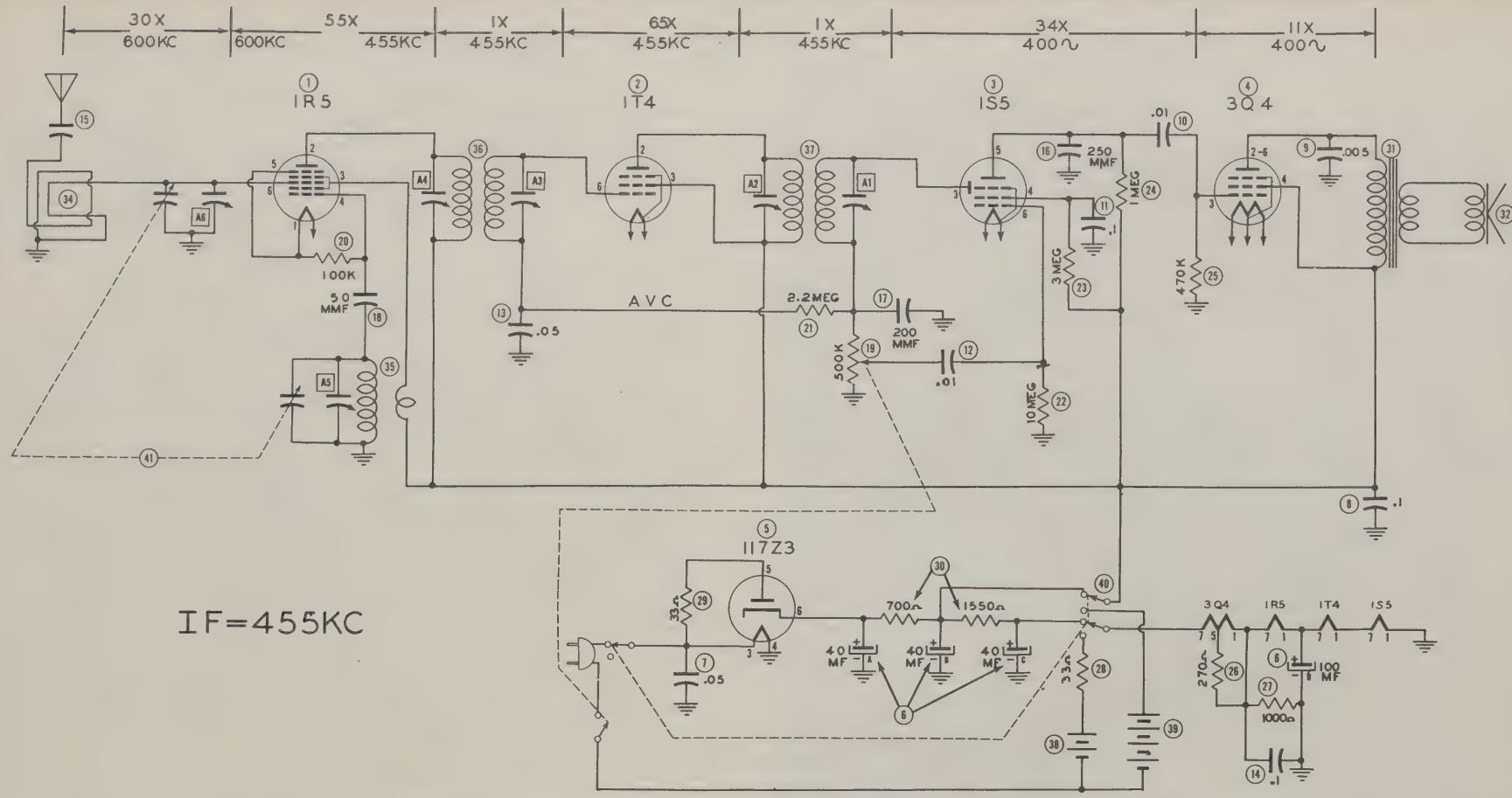


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



MINERVA PORTAPAL MODEL 729



VOLTAGE AND RESISTANCE READINGS TAKEN IN AC-DC POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	3.1VDC	78VDC	78VDC	-5.1VDC$	3.1VDC	0V.	4.4VDC
2	1T4	1.5VDC	78VDC	78VDC	0V.	1.5VDC	0V.	3.1VDC
3	1S5	0V.	0V.	-.2VDC	20VDC	10VDC	0V.	1.5VDC
4	3Q4	4.4VDC	75VDC	0V.	78VDC	5.7VDC	75VDC	6.9VDC
5	117Z3	0V.	122VDC	117VAC	0V.	117VAC	122VDC	0V.

$TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	*	1.5KΩ	1.5KΩ	95KΩ	*	3Ω	*
2	1T4	*	1.5KΩ	1.5KΩ	2.7 Meg.	*	2.2 Meg.	*
3	1S5	0Ω	INF.	500KΩ	3 Meg.	1 Meg.	10 Meg.	*
4	3Q4	*	2.2KΩ	450KΩ	1.5KΩ	*	2.2KΩ	*
5	117Z3	INF.	2.2KΩ	440Ω	0Ω	470Ω	2.2KΩ	0Ω

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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4713-14

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting to chassis.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage reading.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

MONITOR
MODEL M-510 (BATTERY OPERATED)

MONITOR
MODEL M-510 (BATTERY OPERATED)

MONITOR MODEL M-510

TRADE NAME	Monitor, Model M-510 (Factory Model #472)
MANUFACTURER	Monitor Equipment Co., 110 E. 42nd St., New York, N.Y.
TYPE SET	Three Power Portable Superheterodyne Receiver with Loop Antenna
TUBES (FOUR)	Types, 1R5 Converter, 1T4 IF Amp., 1S5 Det.-AVC-AF, 3Q4 Power Output
RATING	.150 Amps. @ 117V AC or 50 MA @ 7.5V DC and 13MA @ 90V DC
POWER SUPPLY	110-120 Volts AC-DC or 7.5 Volts "A" Supply & 90 Volt "B" Supply
TUNING RANGE—BROADCAST	535-1720KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to 1st black dot on right side of dial backplate. This will position the pointer approximately parallel with top of dial backplate. Use battery power when available. If AC power is used, use an isolation transformer when available If not, connect a .1 MFD capacitor in series with the low side of the signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.2 MFD.	High side to rear stator of tuning cap. Low side to chassis.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy ant. to 200MMFD to reduce hum modulation.
2		Place signal generator lead near loop. No direct connection.	1500KC	1st black dot from dot indicating tuning cap. fully open, on dial backplate.	"	A5	Adjust for maximum output.
3		"	"	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

MONITOR
MBL M-10

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MONITOR PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	1R5	1R5	7AT	
2	IF Amp.	1T4	1T4	6AR	
3	Det.-AVC-AF	1S5	1S5	6AU	
4	Power Output	3Q4	3Q4	7BA	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MONITOR PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
5A	60	150	2075	UP6CJ41		DY-804020-150	EL-26 TA-525	AF1C10D PRS50-25	■ Filter ▲ " Fil. Bypass " " " "
B	60	150							
C	20	50							
6	25	25		BR252A	TC26	M-25-25	TA-25	PRS25-25	
7	.1	200		DT4P1	TP428	S-4-1	TC-1	484-.1	
8	.005	400		DT4D5	TP408	S-4-005	TC-25	484-005	Output Plate Bypass
9	.001	600		DT6D1	TP404	S-6-001	TC-21	684-001	Audio Coupling
10	.2	200		DT4P2	TP429	S-4-2	TC-2	484-.2	Audio Plate Decoup.*
11	.02	100		DT4S2	TP423	S-4-02	TC-12	484-.02	Audio Screen Bypass
12	.05	200		DT4S5	TP426	S-4-05	TC-15	484-05	Line Bypass
13	.005	400		DT6D5	TP408	S-6-005	TC-25	484-005	Audio Coupling
14	.02	200		DT4S2	TP423	S-4-02	TC-12	484-02	AVC Filter
15	.05	200		DT4S5	TP426	S-4-05	TC-15	484-05	Fil. Bypass
16	.001	600		DT6D1	TP404	S-6-001	TC-21	684-001	Ext. Ant. Isolation
17	.02	200		DT4S2	TP423	S-4-02	TC-12	484-02	Conv. Screen Decoup.
18	100	500		5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Audio Plate Bypass
19	100	500		5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Diode Filter
20	5	500		5W5V5	MC205	MO.5-55	MS-55	1468-000005	Fixed Trimmer #
21	5	500		5W5V5	MC205	MO.5-55	MS-55	1468-000005	" " #

*Some models use .02 MFD capacitor in this application, replacement same as Item 14.
#Not used in all models.

CONTROLS

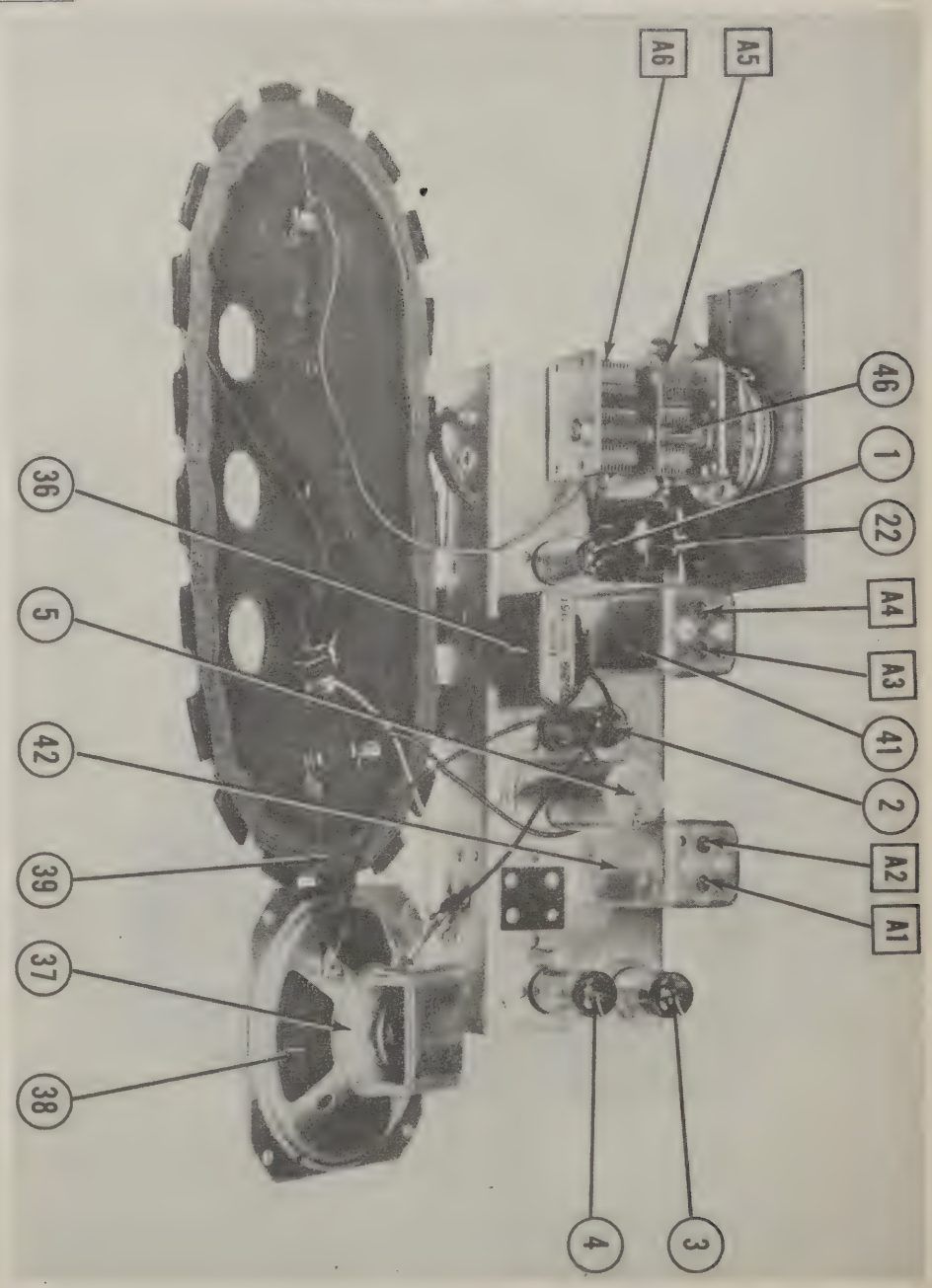
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MONITOR PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
22A	1 Meg.	1		MR53	D13-137	M-63-Z	Volume Control
B	Shaft			Not Req.	A	Not Req.	Attach to 22A per instructions
C	Switch			M27	42	SW-A2	" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MONITOR PART No.	IRC PART No.	IDENTIFICATION CODES
23	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Osc. Grid
24	8200Ω	½		BTS-8200	Gray-Red-Red Converter Screen Dropping
25	3.3 Meg.	½		BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
26	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue 1st AF Grid
27	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. 1st AF Plate Load
28	4.7 Meg.	½		BTS-4.7 Meg.	Yl.-Vi.-Grn. 1st AF Screen Dropping
29	330KΩ	½		BTS-330K	Or.-Or.-Yl. 1st AF Plate Decoupling
30	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. Output Grid
31	220Ω	½		BW-½-220	Red-Red-Br. Filament String-See Note 1
32	47Ω	½		BW-½-47	Yl.-Vi.-Blk. Filament String-See Note 1
33	820Ω	½		BTS-820	Gray-Red-Br. Filament String-See Note 1
34A	660Ω	10		ABA-750	Filter-See Note 2
B	1500Ω	10		AB-1500	Filament Dropping
35	33Ω	1		BW-1-33	Or.-Or.-Blk. Surge Limiter

Note 1-Some models use a single 270Ω resistor in place of Items 31 & 32. IRC replacement BW-1-270
Note 2-On IRC replacement set slider at 660Ω from one end.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MONITOR PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
36	3800Ω	3.3Ω	310Ω	.5Ω	1337	A-387	T22S47		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MONITOR PART No.	JENSEN PART No.		
	FIELD	VC IMP.		ST-113		
37	PM	3.3Ω	5868	Mod. P4-X		
	CONE DIA.	VC DIA.				
38	4"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

R F COILS

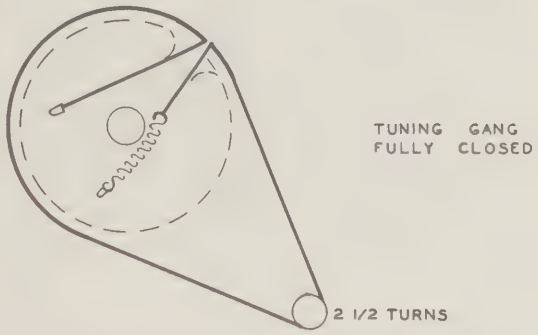
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MONITOR PART No.	MEISSNER PART No.	
39	Loop Ant.	.1Ω	1.5Ω	28190		
40	Osc. Coil	1.5Ω	6Ω	28197	14-1040*	Add 50 MMFD cap. from high side tuning cap. to osc. grid.
41	Input IF	21Ω	21Ω	3371	16-6658	
42	Output IF	30Ω	31Ω	3535	16-6660	

BATTERIES

ITEM No.	VOLTAGE	MONITOR PART No.	EVEREADY			INSTALLATION NOTES
			"A"	"B"	"A-B"	
43	7.5V "A" 90V "B"				753	

MISCELLANEOUS

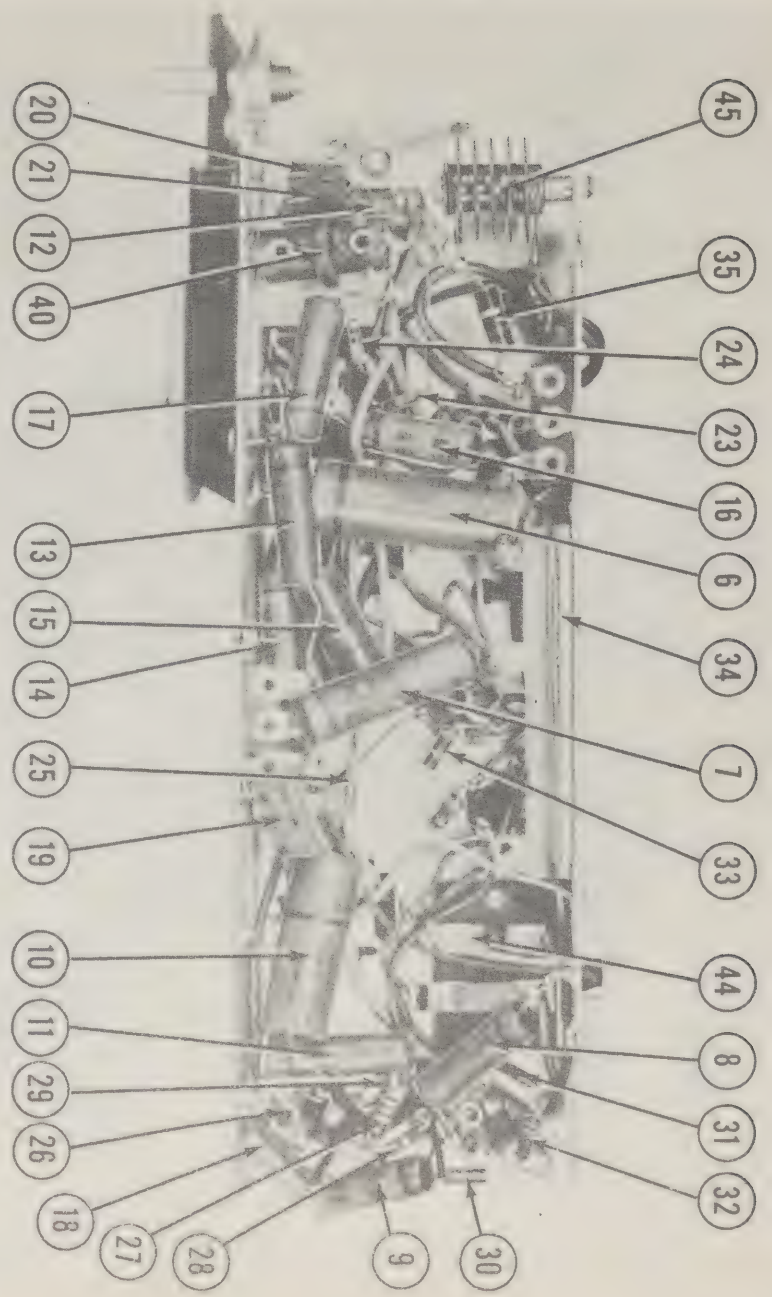
ITEM No.	PART NAME	MONITOR PART No.	NOTES
44	Switch	18132	Power Change
45	Rectifier		Selenium
46	Tuning Cap.	1694	(23-460 MMF, 17-188 MMF)
	Knobs	39164	
	Cabinet	474	



TUNING GANG FULLY CLOSED

DIAL CORD DRIVE

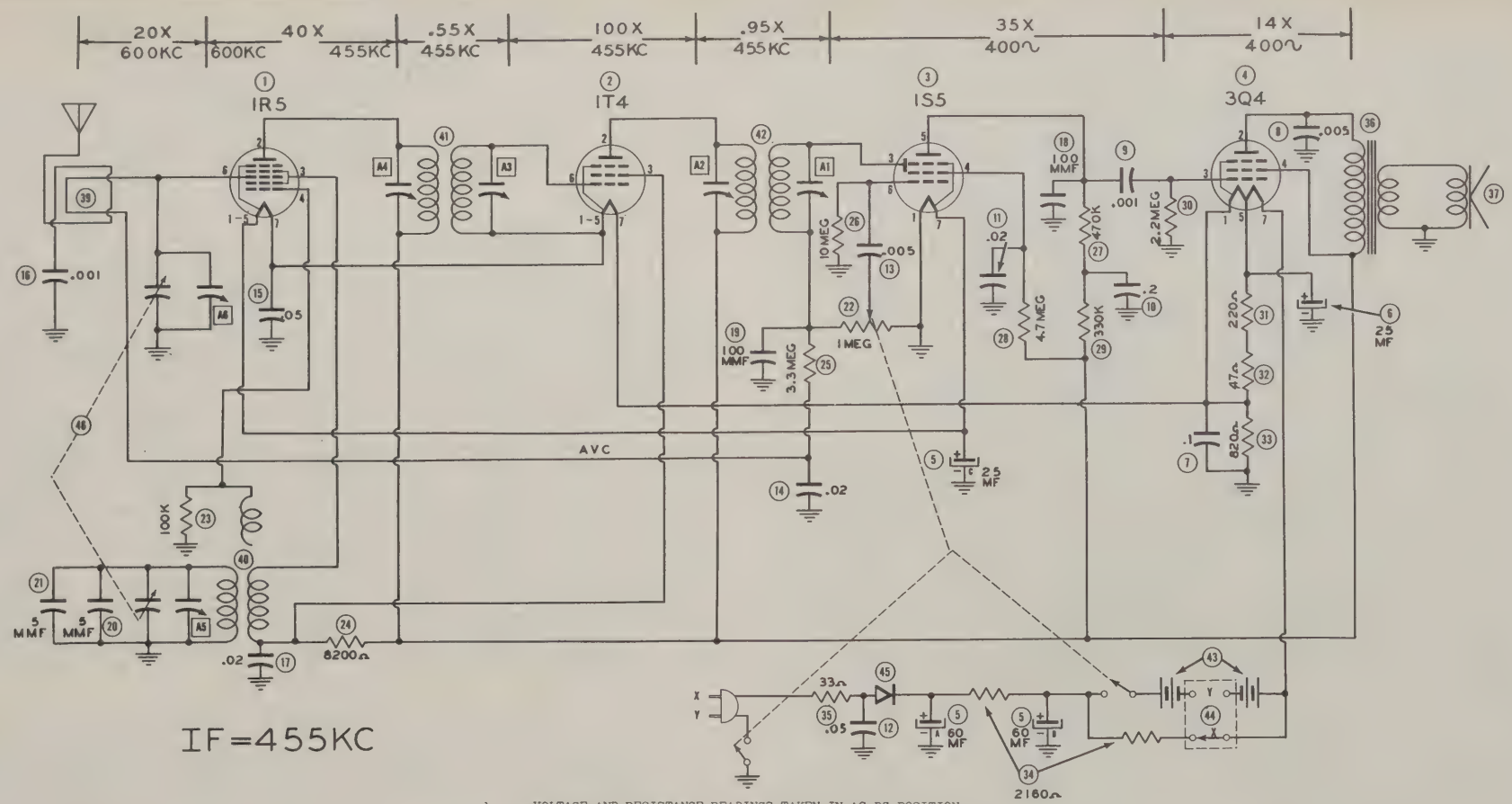
CHASSIS—BOTTOM VIEW



DATE 9/47 SET 23 FOLDER 4713-15

MONITOR MODEL M-510

MONITOR MODEL M-510



VOLTAGE AND RESISTANCE READINGS TAKEN IN AC-DC POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	1.6VDC	85VDC	57VDC	-5VDC§	1.6VDC	-.05VDC	3.5VDC
2	1T4	3.5VDC	85VDC	57VDC	85VDC	3.5VDC	3.4VDC	5VDC
3	1S5	0V.	62VDC	-.05VDC	13.5VDC	26VDC	-.05VDC	1.6VDC
4	3Q4	5VDC	85VDC	0V.	85VDC	6.3VDC	85VDC	7.8VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	*	1500Ω	10KΩ	100K	*	4 Meg.	*
2	1T4	*	1500Ω	10KΩ	1500Ω	*	*	*
3	1S5	*	330K	1 Meg.	5 Meg.	800K	10 Meg.	*
4	3Q4	*	1800Ω	2.2 Meg.	1500Ω	*	1500Ω	*

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

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RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

4713-15

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The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment etc., that an absolute reading is impractical. AVC is made inoperative by shorting to chassis.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

RCA VICTOR
MODEL 65BR9

RCA VICTOR
MODEL 65BR9

RCA MODEL 65BR9

TRADE NAME	RCA Victor, Model 65BR9 (Ch. RC-1045)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, N.J.
TYPE SET	AC-Battery Operated Portable Superheterodyne with Loop Ant. & Self Contained Battery Charger
TUBES (FIVE)	Types, 1T4 RF Amp., 1R5 Converter, 1T4 IF Amp., 1S5 Det.-AVC-AF, 3V4 Power Output.
POWER SUPPLY RATING	110-120 Volts AC or 2 Volt Storage Battery .140 Amp. @ 117 Volts AC or 1.1 Amp. @ 2 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to center line at top of dial backplate. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to Pin 6 (grid) of 1R5. Low side to chassis.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
2		Loop	1600KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1400KC	Tune for maximum output.	"	A6	Adjust for maximum output.
4		"	600KC	"	"	A7	Rock tuning cap. and adjust for maximum output. Repeat Steps 2, 3 and 4.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	1T4	1T4	6AR	
2	Converter	1R5	1R5	7AT	
3	IF Amp.	1T4	1T4	6AR	
4	Det.-AVC-AF	1S5	1S5	6AU	
5	Power Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	15	150	72077	UP2215		DY-2x20-150	EL-221		■ Filter 95695-4
B	15	150							▲ "
C	1200	5		BRH610		M-1500-6	UHC-1500		Filament Bypass
7	.05	400	70615	DT4S5	TP426	S-4-05	TC-15	484-05	Line Filter
8	.5	120	72076		RF480				Hash Filter
9	.5	120	72076		RF480				" "
10	.05	200	70615	DT4S2	TP426	S-4-05	TC-15	484-05	" "
11	.002	1200	70643	MD16D2	OW331	TM-16-002	TR-22	1684-002	Buffer
12	.01	200	72827	DT4S1	TP421	S-4-01	TC-11	484-01	Output Plate Bypass
13	.005	400	71553	DT6D5	TP408	S-6-005	TC-25	484-005	Audio Coupling
14	.03	200	70613	DT4S3	TP424	S-4-03	TC-13	484-03	Audio Screen Bypass
15	.002	200	72315	DT6D2	TP405	S-6-002	TC-22	484-002	Audio Coupling
16	.05	200	70615	DT4S5	TP426	S-4-05	TC-15	484-05	AVC Filter
17	.05	400	70615	DT4S5	TP426	S-4-05	TC-15	484-05	Screen Bypass
18	.5	120	72076		RF480				Filament Bypass
19	270		71540						Output Grid Filter Cer.
20	100		45233	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Diode Filter Cer.
21	100		45233	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	" " "
22	100		45233	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	RF Coupling Cer.

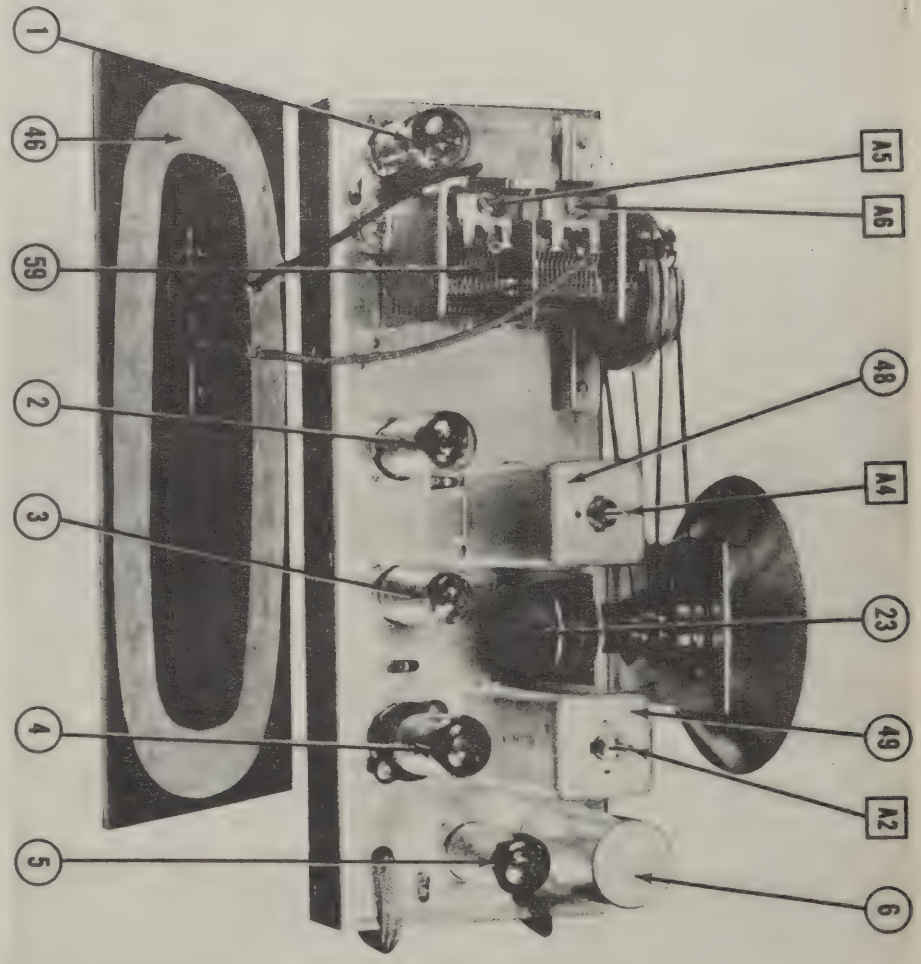
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
23A	1 Meg.	1	38405	MR53	D13-137	M-63-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 23A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA PART No.	IRC PART No.	IDENTIFICATION CODES
24	12KΩ	½	30436	BTS-12K	Br.-Red-Or. RF Plate Load
25	2.2 Meg.	½	30649	BTS-2.2 Meg.	Red-Red-Grn. Converter Grid
26	100KΩ	½	3252	BTS-100K	Br.-Blk.-Yl. Oscillator Grid
27	10 Meg.	½	30992	BTS-10 Meg.	Br.-Blk.-Blue AVC Network
28	27KΩ	½	30409	BTS-27K	Red-Vi.-Or. Screen Dropping
29	7.5Ω	½	71580		Vi.-Grn.-Gold Filament String
30	7.5Ω	½	71580		Vi.-Grn.-Gold " "
31	100KΩ	½	3252	BTS-100K	Br.-Blk.-Yl. Diode Filter
32	10 Meg.	½	30992	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
33	4.7 Meg.	½	30931	BTS-4.7 Meg.	Yl.-Vi.-Grn. AF Screen Dropping
34	220KΩ	½	14583	BTS-220K	Red-Red-Yl. AF Plate Load
35	1 Meg.	½	30652	BTS-1 Meg.	Br.-Blk.-Grn. Output Grid
36	7.5Ω	½	71580		Vi.-Grn.-Gold Filament String
37	1000Ω	½	34766	BTS-1000	Br.-Blk.-Red Filter
38	10KΩ	½	3078	BTS-10K	Br.-Blk.-Or. Hash Suppression
39	150Ω	½	30880	BW-½-150	Br.-Grn.-Br. " "

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA: RCA PART No.	MALLORY PART No.	RADIART PART No.	INSTALLATION NOTES
40	Synchronous	2.0	115∿	72107			Original Part No. K984515-1

TRANSFORMER (VIBRATOR)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA: RCA PART No.	STANCOR PART No.	THORDARSON PART No.	UTAH PART No.
41	2.1V DC @ .8A	280V CT @ .014A			72109			Orig. Part #940858-1

TRANSFORMER (CHARGING)

ITEM No.	RATING Voltage PRI.	RATING Voltage SEC.	RATING Current PRI.	RATING Current SEC.	REPLACEMENT DATA: RCA PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
42	117V AC	3.0V AC	.14A	2.8A	72099				Orig. Part #940921-1

TRANSFORMER (OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA: RCA PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
43	10000Ω	3.8Ω	650Ω	.35Ω	71159	A-3876*	T22S47*		*Bend mounting tabs to duplicate original. Orig. Part #922225-3.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: RCA PART No.	JENSEN PART No.		INSTALLATION NOTES
44	FIELD PM	VC IMP. 3.4Ω	72201	ST-105† Mod. P5-X		†Drill and tap magnet frame. Orig. Part No. 92572-2W
45	CONE DIA. 4½"	VC DIA. ½"	NOT READILY	REPLACEABLE-USE COMPLETE SPEAKER UNIT		

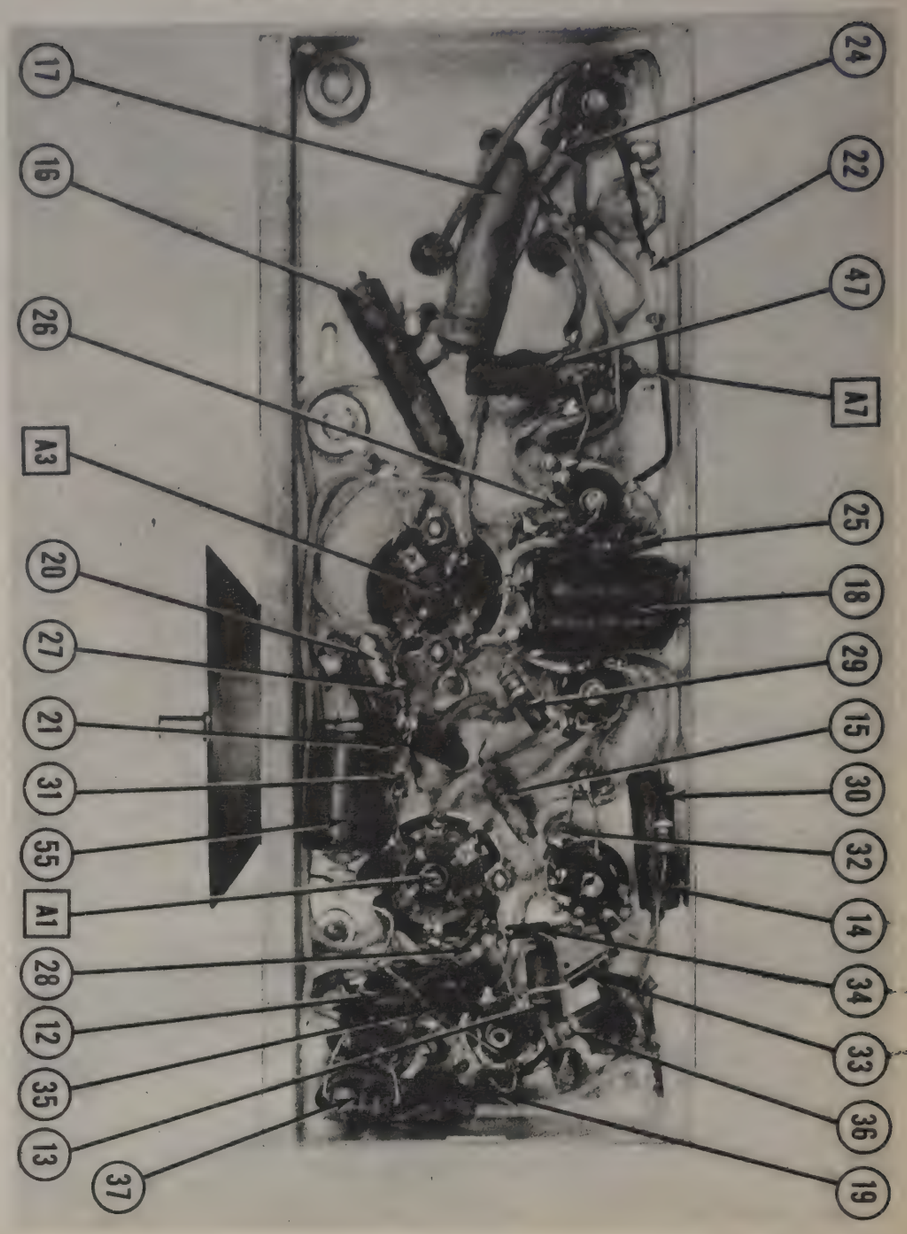
R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: RCA PART No.	MEISSNER PART No.	
46	Loop Ant.		1.5Ω	72086		
47	Osc. Coil	.5Ω	4Ω	72072		
48	Input IF	19Ω	19Ω	71399		
49	Output IF	19Ω				
		.5Ω*	19Ω	71400		
50	RF Choke		12Ω	72322		
51	" "		0Ω	72102		Wound on 1 Megohm resistor
52	" "		0Ω	72102		
53	" "					

*Tertiary winding.

DATE 9/47 SET 23 FOLDER 4713-16

CHASSIS—BOTTOM VIEW



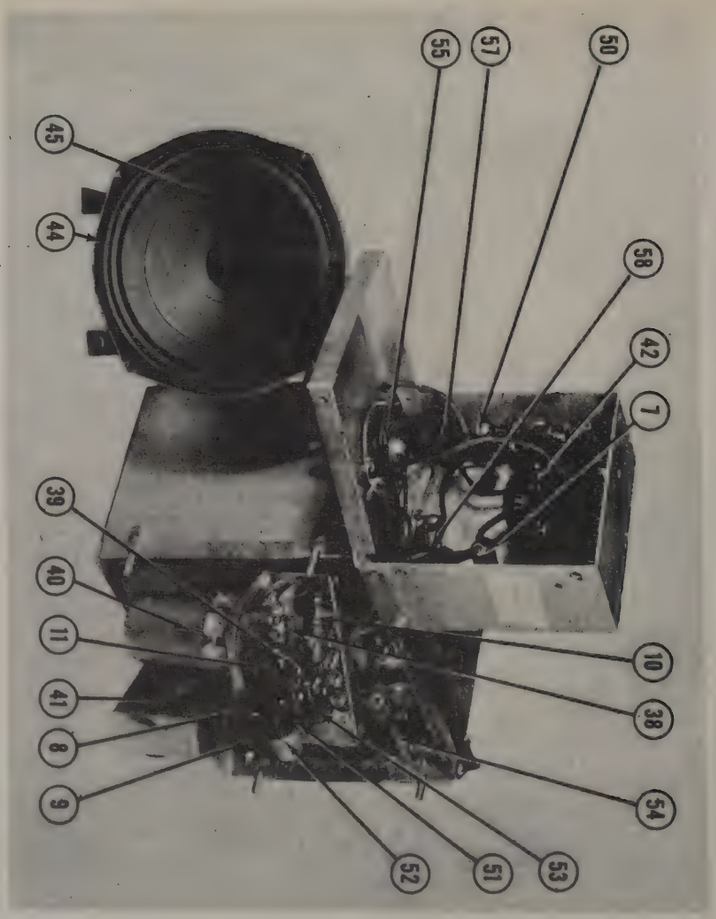
PARTS LIST AND DESCRIPTIONS (Continued)

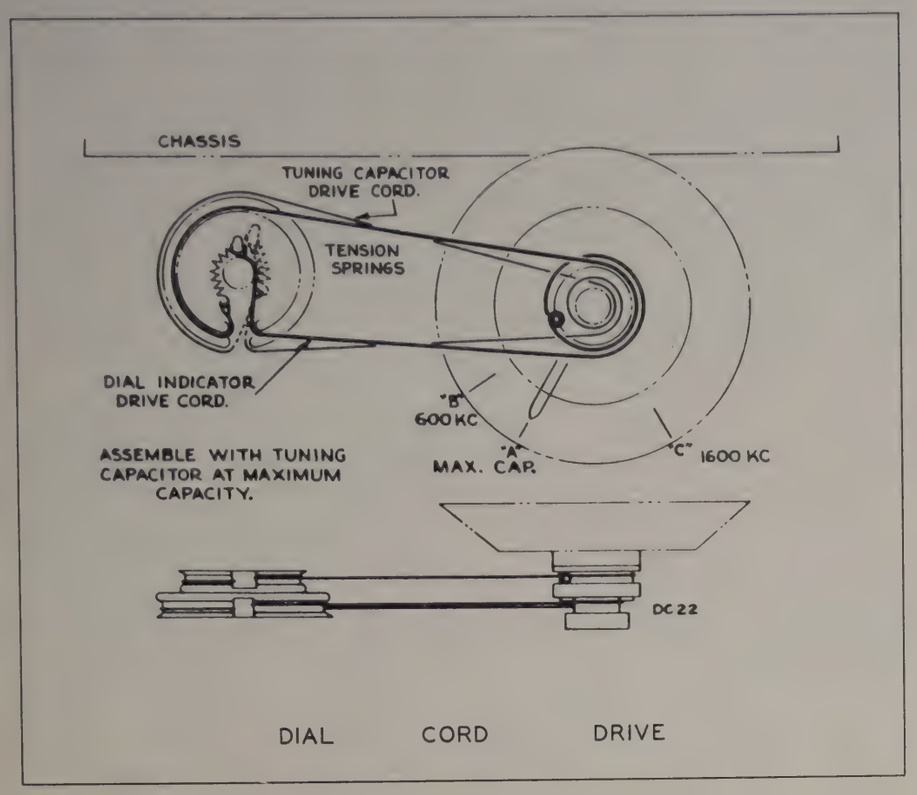
MISCELLANEOUS

ITEM No.	PART NAME	RCA PART No.	NOTES
54	Battery	72216	Wet
55	Switch	72100	Power Selector
56	Bias Cell	72318	
57	Rectifier	72103	Dry Disc
58	Fuse	72104	3 AG-1/4 Amp.
59	2 Gang Var.Cap.	72073	43-469 MMF, 29-155 MMF
	Indicator	72075	Station Indicator

DISASSEMBLY INSTRUCTIONS

1. Remove two push-on type control knobs.
2. Remove spring clip from inside cabinet holding off and on plate. Remove plate.
3. Remove six screws holding battery in cabinet. Remove battery.
4. Remove speaker plug.
5. Remove two hex nuts holding speaker mounting bracket in cabinet. Remove bracket and speaker from cabinet.
6. Remove two hex nuts holding chassis in cabinet. Remove chassis.
7. Remove two Phillips head screws holding loop antenna in cabinet. Remove loop.





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1T4	0V.	82VDC	37VDC	90VDC	0V.	-.05VDC	1.3VDC
2	1R5	0V.	90VDC	37VDC	-5VDC	0V.	0V.	1.3VDC
3	1T4	0V.	90VDC	37VDC	2VDC	0V.	0V.	1.3VDC
4	1S5	0V.	0V.	-.05VDC	21VDC	66VDC	0V.	1.3VDC
5	3V4	1.3VDC	87VDC.	90VDC	0V.	0V.	-.6VDC	1.3VDC

$TAKEN WITH VACUUM TUBE VOLTMETER

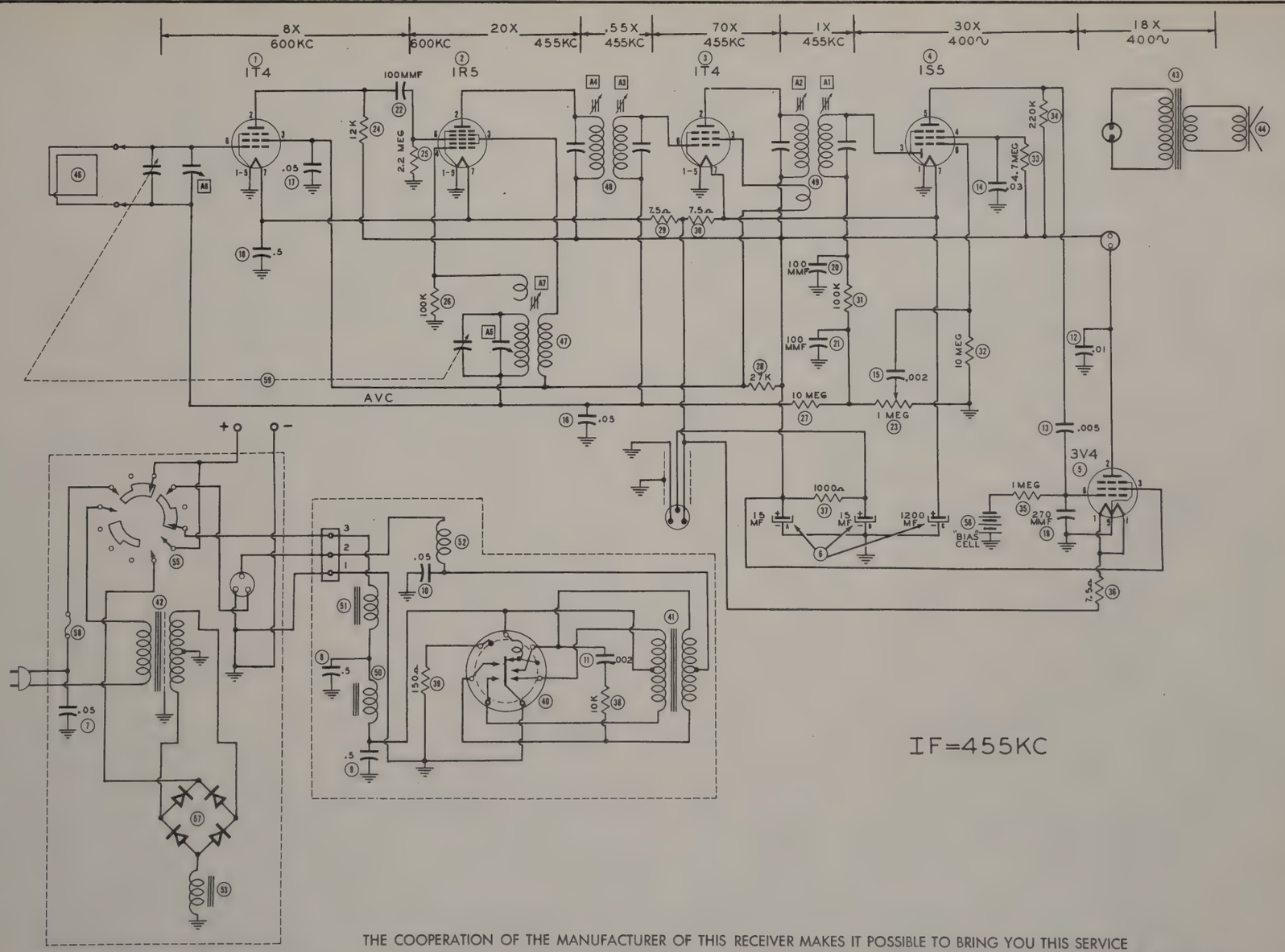
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1T4	0Ω	230KΩ	230KΩ	250KΩ	0Ω	10 MEG.	*
2	1R5	0Ω	250KΩ	280KΩ	100KΩ	0Ω	2.1 MEG.	*
3	1T4	0Ω	250KΩ	280KΩ	*	0Ω	10 MEG.	*
4	1S5	0Ω	INF.	900KΩ	5 MEG.	470KΩ	10 MEG.	*
5	3V4	*	250KΩ	250KΩ	INF.	0Ω	#	*

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

#DO NOT USE OHMMETER TO MEASURE RESISTANCE ON TUBE 5 PIN 6.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



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The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is shorted to chassis during stage gain measurements.

TRADE NAME RCA Victor Models 68R1, 68R2, 68R3, 68R4 (Chassis No. RC-608)
MANUFACTURER Radio Corp. of America, RCA Victor Div., Camden, N.J.
TYPE SET AC Operated AM-FM Superheterodyne Receiver with Loop Antenna
TUBES (EIGHT) Types, 6BE6 FM Converter, 6BE6 AM Converter, 6BA6 IF Amp., 6AU6 FM Driver, 6AL5 Ratio Detector, 6SQ7 AM 2nd Det.-AF-AVC, 6K6GT Power Output, 5Y3GT Rectifier.

POWER SUPPLY 105-125 Volts AC RATING .610 Amps. @ 117V AC
TUNING RANGE—BROADCAST 540-1600KC FM 88-108MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning capacitor fully closed and set pointer at calibration mark at bottom of dial backplate. Use a vacuum tube voltmeter as an output indicator when aligning the FM channels. The two 68KΩ resistors used in Step 2 should be equal within 1%. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01 MFD.	High side to Pin #1 (grid) of 6AU6. Low side to chassis.	10.7MC (Amplitude modulation 400Ω at 30%).	FM (fully clockwise)	Tuning cap. fully closed	VTVM across cap. 10.	A1	Connect a 680Ω resistor between Pins 5 & 7 of 6AL5. Adjust for maximum voltage. (Set output of signal generator to give approx. 14.5 volt reading on VTVM).
2	.01 MFD.	"	"	"	"	*(See Note Below)	A2	Remove 680Ω resistor. Adjust A2 for zero reading. Zero point is approached rapidly and continued adjustment causes polarity to reverse. A slow approach to the zero point is an indication of severe detuning and A2 should be turned in the opposite direction.
3	.01 MFD.	"	"	"	"	Output meter across voice coil. (Leave VTVM connected as in Step 2.	A3	Adjust for minimum output. The zero DC balance and minimum AF output should occur at the same point. If they do not it may be necessary to adjust A2 & A3 simultaneously so that they will occur at the same point. Repeat Step 1 omitting the 680Ω resistor. Remove all connections.
4	.01 MFD.	High side to one of the FM antenna terminals. Low side to the other FM antenna terminal.	"	"	"	VTVM across capacitor 10.	A4,A5, A6,A7.	Alternately load pri. & sec. of each trans. with 680Ω while the opposite winding of the same trans. is being adjusted. Adjust for maximum reading on VTVM.
5	2 120Ω carbon resistors.	High side to one of the FM ant. terminals in series with 120Ω. Low side to the other FM ant. terminal in series with 120Ω.	106MC	"	5-3/4" to right from calibration backplate.	"	A8,A9	Adjust for maximum reading in order given.
6	"	"	90MC	"	1-1/8" to right from calibration mark on dial backplate.	"	A10,A11	Adjust for maximum reading in order given. Repeat Steps 5 and 6 until no further improvement can be made.
7	.01 MFD.	High side to Pin 1 (grid) of 6BE6. Low side to chassis.	455KC	BC (center position)	Tuning cap. fully open.	Across voice coil	A12,A13 A14,A15	Adjust for maximum output. Do not disturb any 10.7 MC IF Adjustments as it will detune the 455KC IF's.
8	200MMF.	High side to ant. terminal (link open). Low side to chassis.	1400KC	"	5-31/32" to right from calibration mark on dial backplate.	"	A16,A17	Adjust for maximum output in order given.
9	200MMF.	"	600KC	"	Tune for maximum output.	"	A18	Rock tuning capacitor and adjust for maximum output. Repeat Steps 8 and 9 until no further increase can be obtained.

Reinstall receiver in cabinet and tune in a weak station near 1400KC and adjust A17 for maximum volume.

*Connect two 68KΩ resistors in series across capacitor 10. Connect common lead of VTVM to junction of these resistors. Connect DC probe to terminal "A" of ratio detector transformer.

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DATE 9/47 SET 23 FOLDER 4713-17

RCA VICTOR
MODELS 68R1, 68R2, 68R3, 68R4

RCA VICTOR
MODELS 68R1, 68R2, 68R3, 68R4

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	FM Converter	6BE6	6BE6	7CH	
2	AM Converter	6BE6	6BE6	7CH	
3	IF Amplifier	6BA6	6BA6	7BK	
4	FM Driver	6AU6	6AU6	7BK	
5	Ratio Detector	6AL5	6AL5	6BT	
6	AM 2nd Det.-AF-AVC	6SQ7	6SQ7	8Q	
7	Power Output	6K6GT	6K6GT	7S	
8	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

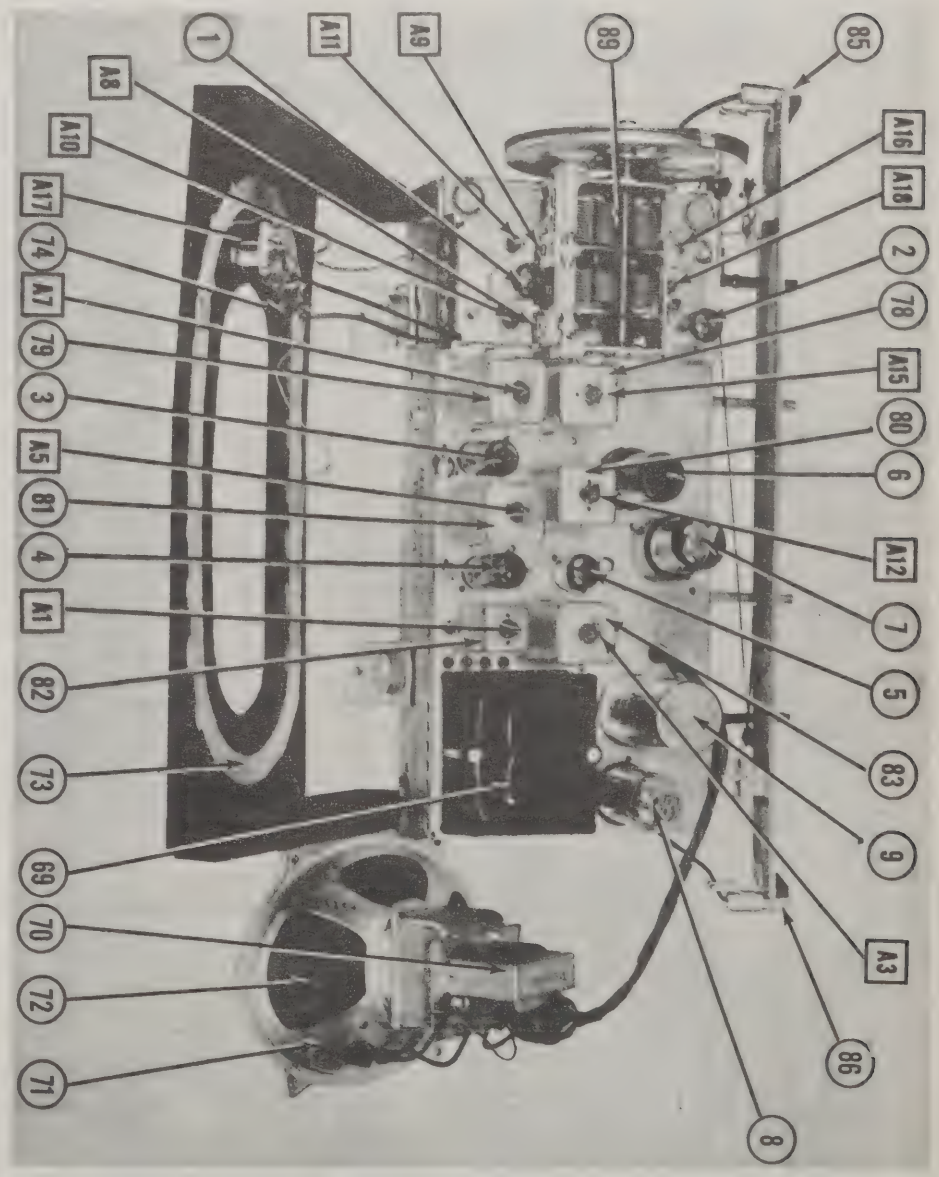
Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
9A	30	450	72271	UP9DJ53		DY-406			● Filter
B	15	450				M-25-25			■ "
C	15	450							▲ "
D	40	25							Output Cathode Bypass
10	5	50	72121	BR550	TC40	M-4-150	TA-55	PRS150-4	Ratio Det. Bias Net
11	.003	1000	71087	MD16D3	TP457		TR-23	1084-003	Line Bypass
12	.005	1000	70648	MD16D5	TP459		TR-25	1084-005	Output Plate Bypass
13	.005	400	70606	DT6D5	TP408	S-6-005	TC-25	484-005	Audio Coupling
14	.005	200	72490	DT6D5	TP408	S-6-005	TC-25	484-005	De-emphasis
15	.0025	400	70602	DT6D3	TP406	S-6-003	TC-23	484-003	Tone Compensation
16	.01	200	71923	DT4S1	TP421	S-4-01	TC-11	484-01	" "
17	.0025	400	70602	DT6D3	TP406	S-6-003	TC-23	484-003	Audio Coupling
18	.01	400	71925	DT4S1	TP421	S-4-01	TC-11	484-01	RF Bypass Power Supply
19	.005	400	71553	DT6D5	TP408	S-6-005	TC-25	484-005	Driver Plate Decoup.
20	.005	400	71553	DT6D5	TP408	S-6-005	TC-25	484-005	Driver Screen Bypass
21	.005	200	72490	DT6D5	TP408	S-6-005	TC-25	484-005	Driver Cathode Bypass
22	.005	400	71553	DT6D5	TP408	S-6-005	TC-25	484-005	IF Plate Decoup.
23	.005	400	71553	DT6D5	TP408	S-6-005	TC-25	484-005	IF Screen Bypass
24	.01	400	71925	DT4S1	TP421	S-4-01	TC-11	484-01	FM Conv. Plate Decoup.
25	.01	400	71925	DT4S1	TP421	S-4-01	TC-11	484-01	FM Conv. Screen Bypass
26	.05	200	71551	DT4S5	TP426	S-4-05	TC-15	484-05	AVC Filter
27	.005	200	72490	DT6D5	TP408	S-6-005	TC-25	484-005	Ratio Detector Filter
28	.01	200	71923	DT4S1	TP421	S-4-01	TC-11	484-01	Audio Coupling
29	.005	200	72490	DT6D5	TP408	S-6-005	TC-25	484-005	Ratio Detector Filter
30	47		39042						Fil. Bypass
31	120		71614						Audio Plate Bypass
32	120		71614						Ratio Detector Bypass
33	330	500	72571						FM Conv. Screen Bypass
34	27		72570						FM Osc. Grid Cap.
35	120		71614						RF Coupling
36	56		71924						AM Osc. Grid Cap.
37	390	500	72639						Fixed Pad

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
38A	2 Meg.	1	38404	MRT454	D13-139X	T-120	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 38A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	RCA PART No.	IRC PART No.	
39	22KΩ	½	30492	BTS-22K	Red-Red-Or. FM Oscillator Grid
40	10KΩ	1	71914	BTA-10K	Br.-Blk.-Or. FM Converter Screen Dropping
41	8200Ω	1	33838	BTA-8200	Gray-Red-Red FM Converter Screen Dropping
42	1000Ω	½	34766	BTS-1000	Br.-Blk.-Red FM Oscillator Decoupling
43	22KΩ	½	30492	BTS-22K	Red-Red-Or. AM Oscillator Grid
44	2.2 Meg.	½	30649	BTS-2.2 Meg.	Red-Red-Grn. AM Converter Grid
45	18KΩ	2	39158	BT-2-18K	Br.-Gray-Or. AM Converter Screen Dropping
46	47Ω	½	30732	BW-½-47	Yl.-Vi.-Blk. IF Cathode
47	22KΩ	1	71989	BTA-22K	Red-Red-Or. IF Screen Dropping
48	1500Ω	1	72762	BTA-1500	Br.-Grn.-Red IF Decoupling
49	270KΩ	½	30651	BTS-270K	Red-Vi.-Yl. AVC Network
50	2.2 Meg.	½	30649	BTS-2.2 Meg.	Red-Red-Grn. " "
51	270KΩ	½	30651	BTS-270K	Red-Vi.-Yl. RF Filter
52	120Ω	½	30189	BW-½-120	Br.-Red-Br. Driver Cathode
53	27KΩ	½	30409	BTS-27K	Red-Vi.-Or. Driver Screen Dropping
54	1000Ω	½	34766	BTS-1000	Br.-Blk.-Red Driver Plate Decoupling
55	15KΩ	½	36714	BTS-15K	Br.-Grn.-Or. De-emphasis
56	22KΩ	½	30492	BTS-22K	Red-Red-Or. Ratio Detector Bias Network
57	2.2 Meg.	½	30649	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
58	22 Meg.	½	71917	BTS-22 Meg.	Red-Red-Blue AVC Bias Network
59	10 Meg.	½	30992	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
60	270KΩ	½	30651	BTS-270K	Red-Vi.-Yl. AF Plate Load
61	470KΩ	½	30648	BTS-470K	Yl.-Vi.-Yl. Output Grid
62	680Ω	1	19233	BTA-680	Blue-Gray-Br. Output Cathode
63	39KΩ	½	30147	BTS-39K	Or.-White-Or. Tone Compensation
64	470KΩ	½	30648	BTS-470K	Yl.-Vi.-Yl. Phono Shunt
65	220Ω	2	53005	BW-2-220	Red-Red-Br. Filter
66	3300Ω	2	19525	BT-2-3300	Or.-Or.-Red Filter
67	3300Ω	2	19525	BT-2-3300	Or.-Or.-Red Filter
68	1 Meg.	½	30652	BTS-1 Meg.	Br.-Blk.-Grn. FM Antenna Loading

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			INSTALLATION NOTES
	PRI.	SEC. 1	SEC. 2	SEC. 3	RCA PART No.	STANCOR PART No.	THORDARSON PART No.	
69	117V AC @ .61A	660V CT @ .07A	5.1V AC @ 2.0A	6.6V AC @ 2.6A	71975	P-6011*	T22R02*	*Drill new mounting holes. Original Part # 94158-503.

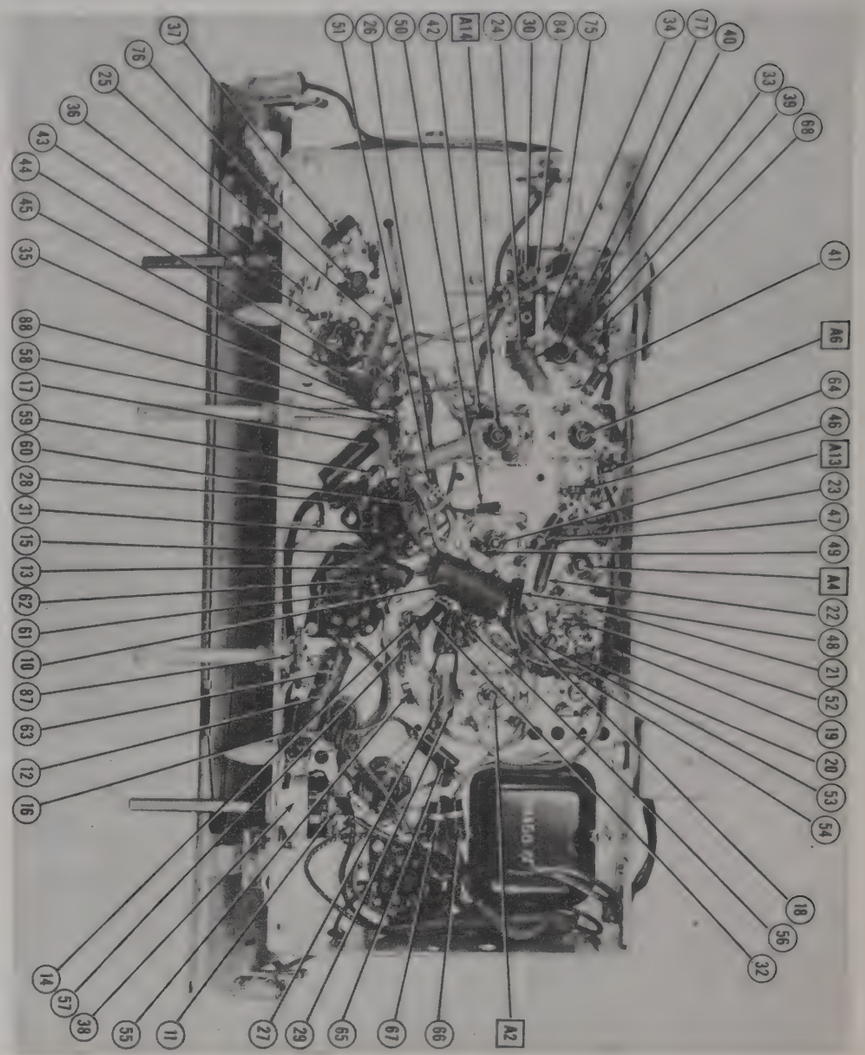
TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		RCA PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
70	6600Ω	3.6Ω	390Ω	.3Ω	72332	A-3849	T22S58*		Original Part No. 940905-1 *Drill new mounting holes.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			RCA PART No.	JENSEN PART No.		
71	FIELD FM	VC IMP. 3.6Ω	92573-1K			
72	CONE DIA. 4-7/8" x 7-1/8"	VC DIA. 3/4"	72728			

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

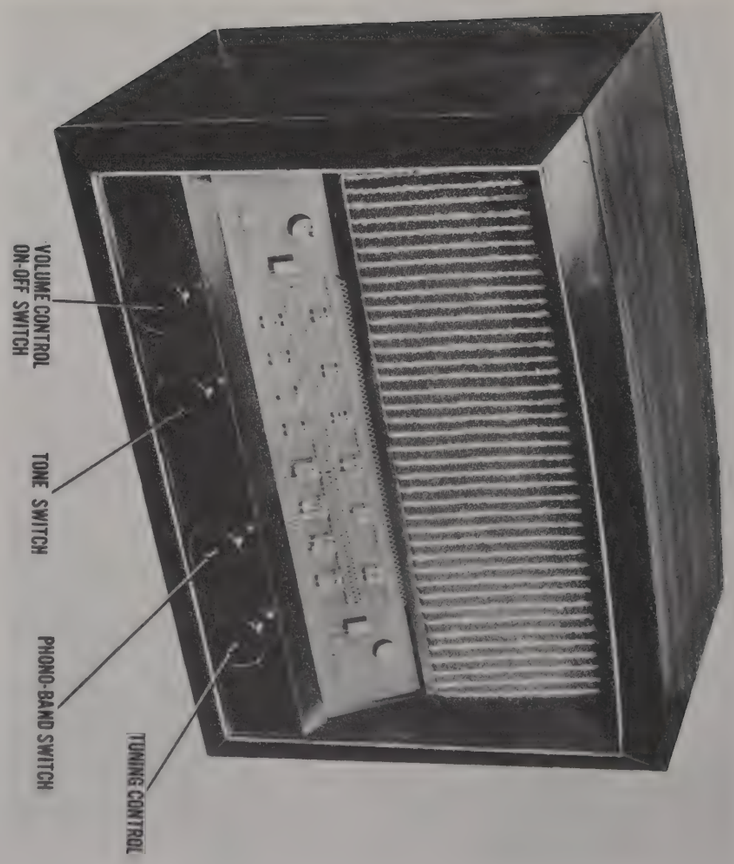
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	RCA PART No.	MEISSNER PART No.	
73	Loop Ant.		1.2Ω	72159		
74	Loop Primary Coil	1Ω	1Ω	36031		
75	FM Ant.Coil	0Ω	0Ω	72335		
76	Broadcast Osc. Coil		4Ω	72333	14-1040	
77	FM Osc.Coil		0Ω	72336		
78	AM Input IF	12Ω	12Ω	71625	16-5740	
79	FM Input IF	0Ω	0Ω	72593	16-6665	
80	AM OutputIF	8Ω	8Ω	71631	16-5742	
81	FM Inter.IF	.7Ω	.4Ω	72723	16-6665	
82	FM Driver Trans.	.3Ω	.2Ω	71935		
83	Ratio Det. Trans.		.1Ω	71934		
84	Filament Choke		0Ω	72574		

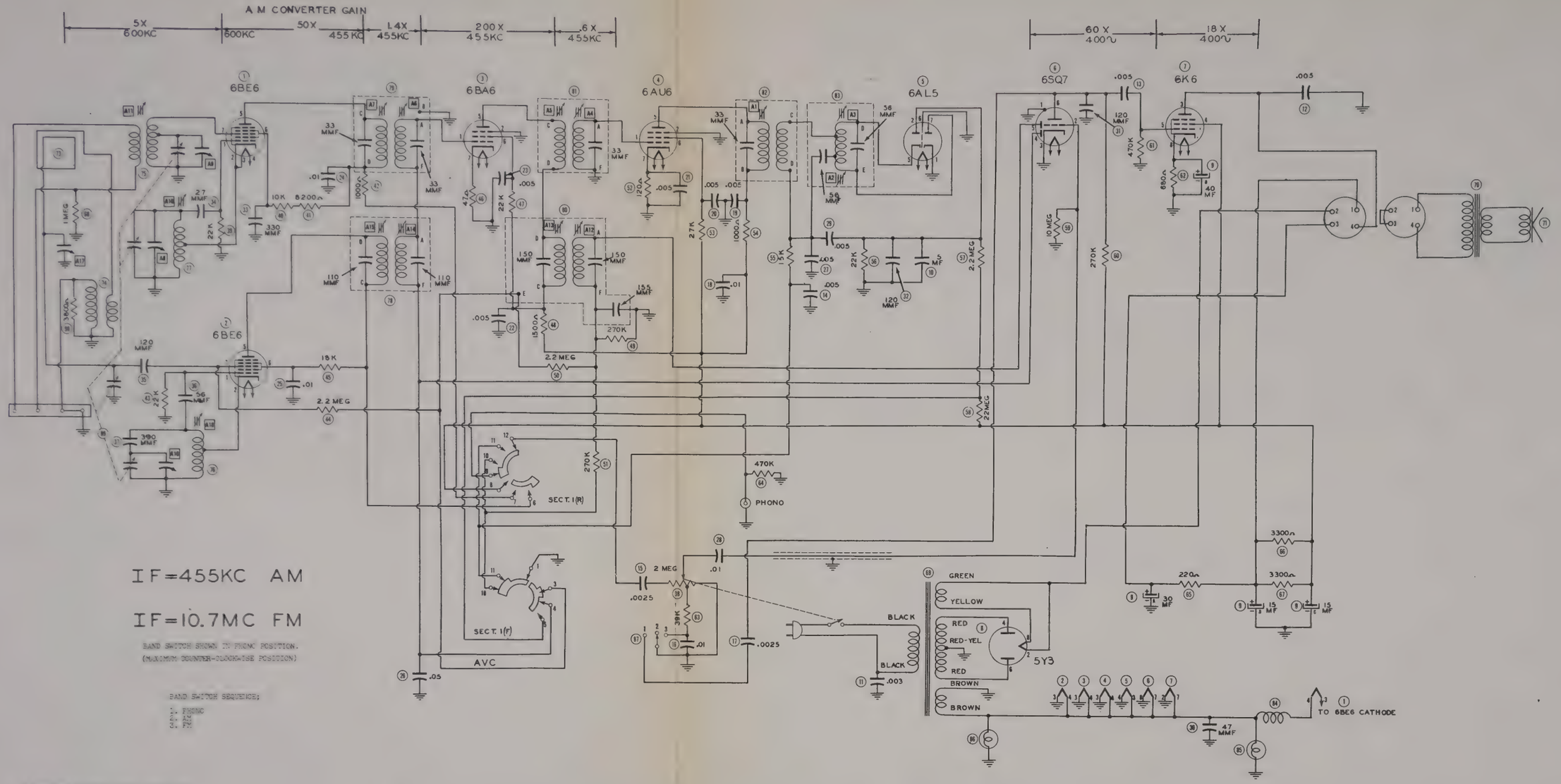
DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					RCA PART No.		
85	Bayonet	7.5	0.2	White	11765		Type 51
86	"	"	"	"	"		" "

MISCELLANEOUS

ITEM No.	PART NAME	RCA PART No.	NOTES
87	Tone Switch	71603	
88	Band Switch	72660	
89	Tuning Capacitor	72659	
A8	Trimmer Cap.	72046	FM Osc. Adj. (2.5-13 MMF)
A9	" "	71808	FM Ant. Adj. (3-35 MMF)
A16	" "	72334	AM Osc. Adj. (4-70 MMF)
A17	" "	38257	AM Osc. Pad. (2-20 MMF)
	Cabinet	Y1396	Brown Plastic Model 68R1
	"	Y1397	Ivory, Plastic Model 68R2
	Dial Scale	72653	Glass, Models 68R1, 68R2, 68R3
	" "	72813	" , Model 68R4
	Indicator	72061	Station Selector
	Knob	71821	Maroon for Model 68R1, 68R3, 68R4
	"	70474	Ivory for Model 68R2





IF=455KC AM

IF=10.7MC FM

BAND SWITCH SHOWN IN FM/MC POSITION.
(MAXIMUM COUNTER-CLOCKWISE POSITION)

BAND SWITCH SEQUENCE;
1. FM/MC
2. AM
3. FM

1 PHOTOFACT STANDARD NOTATION SCHEMATIC.
2 HOWARD W. SAMS & CO., INC., 1947

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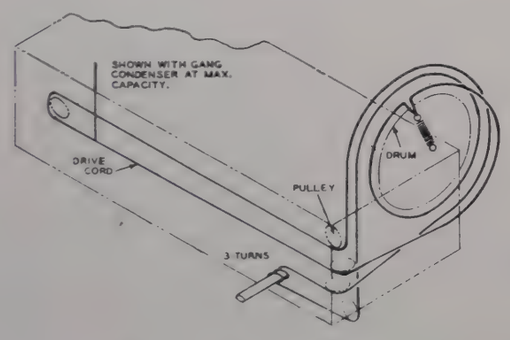
4713-17



DIAL CORD DRIVE

*TAKEN IN FM POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
* 1	6BE6	-1.8VDC	0V.	0V.	6.6VAC	245VDC	120VDC	0V.	--
2	6BE6	-7VDC§	0V.	0V.	6.6VAC	250VDC	120VDC	0V.	--
3	6BA6	-.6VDC	0V.	0V.	6.6VAC	230VDC	127VDC	.8VDC	--
* 4	6AU6	0V.	0V.	0V.	6.6VAC	245VDC	167VDC	1.4VDC	--
* 5	6AL5	0V.	-.7VDC	6.6VAC	0V.	-.4VDC	0V.	-.3VDC	--
6	6SQ7	0V.	-.5VDC	0V.	-.6VDC	-.4VDC	107VDC	6.6VAC	0V.
7	6K6GT	0V.	0V.	330VDC	270VDC	0V.	0V.	6.6VAC	20VDC
8	5Y3GT	0V.	350VDC	275VDC	330VAC	40VAC	330VAC	6.6VAC	350VDC

§TAKEN WITH VACUUM-TUBE VOLTMETER.

RESISTANCE READINGS

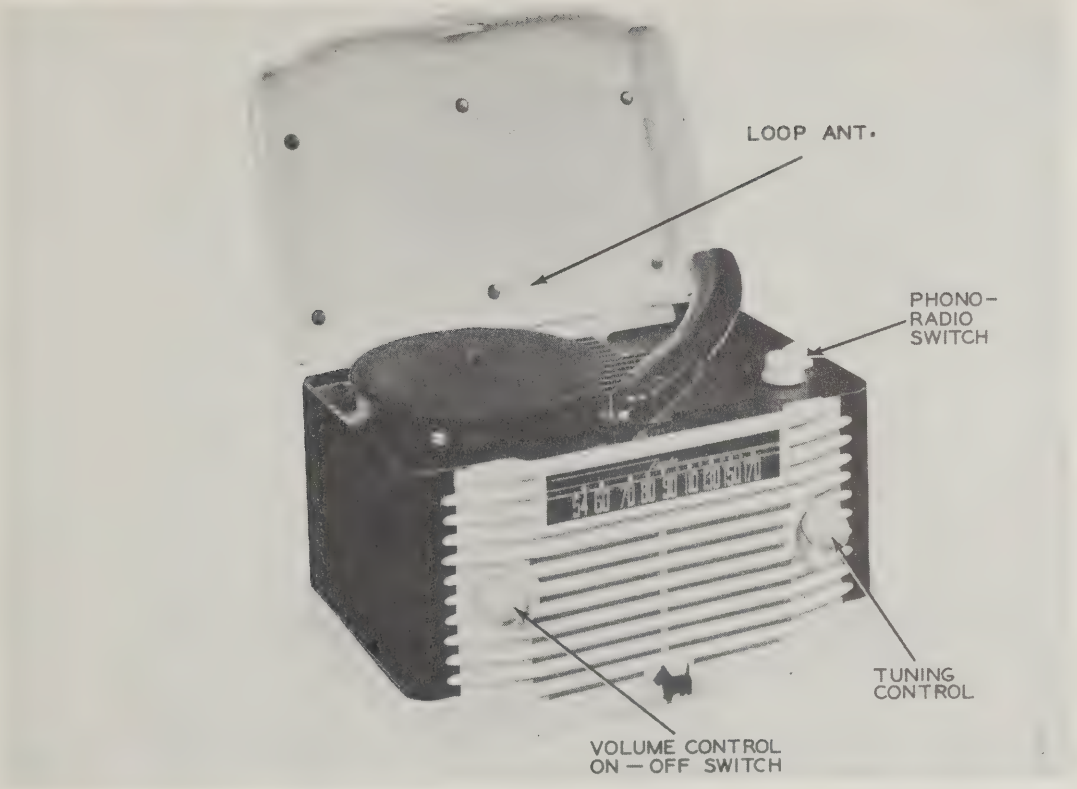
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
* 1	6BE6	22KΩ	.1Ω	.1Ω	.2Ω	100KΩ	120KΩ	0Ω	--
2	6BE6	22KΩ	.4Ω	0Ω	.1Ω	100KΩ	120KΩ	4.5 MEG.	--
3	6BA6	2.2 MEG.	0Ω	0Ω	.1Ω	100KΩ	120KΩ	47Ω	--
* 4	6AU6	.6Ω	0Ω	0Ω	.1Ω	100KΩ	130KΩ	120Ω	--
* 5	6AL5	0Ω	20KΩ	.1Ω	0Ω	INF.	0Ω	INF.	--
6	6SQ7	0Ω	10 MEG.	0Ω	2.2 MEG.	260KΩ	300KΩ	.1Ω	0Ω
7	6K6GT	0Ω	0Ω	100KΩ	100KΩ	470KΩ	INF.	.1Ω	680Ω
8	5Y3GT	0Ω	100KΩ	100KΩ	250Ω	INF.	250Ω	.1Ω	100KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

REMLER
MODELS 5300 B, 5300 BI, 53001



REMLER MODEL 5300BI

TRADE NAME	Remler, Models 5300B, 5300BI, 5300I
MANUFACTURER	Remler Co., Ltd., 2101 Bryant St., San Francisco 10, Calif.
TYPE SET	AC Operated Radio-Phonograph Combination with Loop Antenna
TUBES (FIVE)	Types, 12BE6 Converter, 12BA6 IF Amp., 12AT6 Det.-AVC-AF, (2) 50B5 Power Output.
POWER SUPPLY	110-120 Volts AC
TUNING RANGE—BROADCAST	540-1730KC RATING .270 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to stator of rear section of tuning capacitor. Low side to B-.	450KC	Tuning capacitor fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD. to reduce hum modulation.
2		Loop	1730KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1400KC	Tune for maximum output.	"	A6	Adjust for maximum output.

DISASSEMBLY INSTRUCTIONS

1. Loosen set screws and remove three control knobs.
2. Remove lock nut from radio-phono control shaft.
3. Remove turn table from record player.
4. Remove six screws holding record player in cabinet.
5. Remove phono-pickup plug from chassis.
6. Disconnect phono-motor leads.
7. Remove record player from cabinet.
8. Remove four screws from bottom of cabinet holding chassis. Remove chassis from cabinet.

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PARTS LIST AND DESCRIPTIONS

REMLER MODELS
[illegible]

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		REMLER PART No.	STANDARD REPLACEMENT		
1	Converter	12BE6	[illegible]	7GH	
2	IF Amp.	12BA6	[illegible]	7BK	
3	Det.-AVC-AF	12AT6	[illegible]	7BT	
4	Power Output	[illegible]	[illegible]	7BL	
5	" "	50B5	[illegible]	7AL	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	REMLER PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	
6A	80	150		EZ3315†	2N521	DSB-8040-150	EL-340†	PRSA150-40-80	Filter - Red
B	40	150		BR4015					" - Yellow
7	.05	600		DT6S5	TP415	MPW-6-05	TC-15	684-05	Line Filter
8	.01	600		DT6S1	TP410	S-6-01	TC-11	684-01	Audio Coupling
9	.004	600		DT6D4	TP407	S-6-004	TC-24	684-004	" "
10	.2	200		DT4P2	TP403	S-4-2	TC-2	484-2	Line Isolation
11	.004	600		DT6D4	TP407	S-6-004	TC-24	684-004	Phono Tone Compensation
12	.05	600		DT6S5	TP415	S-6-05	TC-15	684-05	Phono Isolation
13	.05	600		DT6S5	TP415	S-6-05	TC-15	684-05	AVC Network
14	.05	600		DT6S5	TP415	S-6-05	TC-15	684-05	Output Plate Bypass
15	500	500		5W5T5	MC245	MO.5-35	1FM-35	1466-0005	AF Plate Bypass
16	500	500		5W5T5	MC245	MO.5-35	1FM-35	1466-0005	Diode Filter
17	500	500		5W5T5	MC245	MO.5-35	1FM-35	1466-0005	RF Coupling
18	70	5		5W5T1	MC235	MO.5-31	1FM-31	1466-0001	Osc. Grid Cap.

†Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	REMLER PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
19A	1 Meg.	1	L-20393	MR53	D13-137	M-53-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 19A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

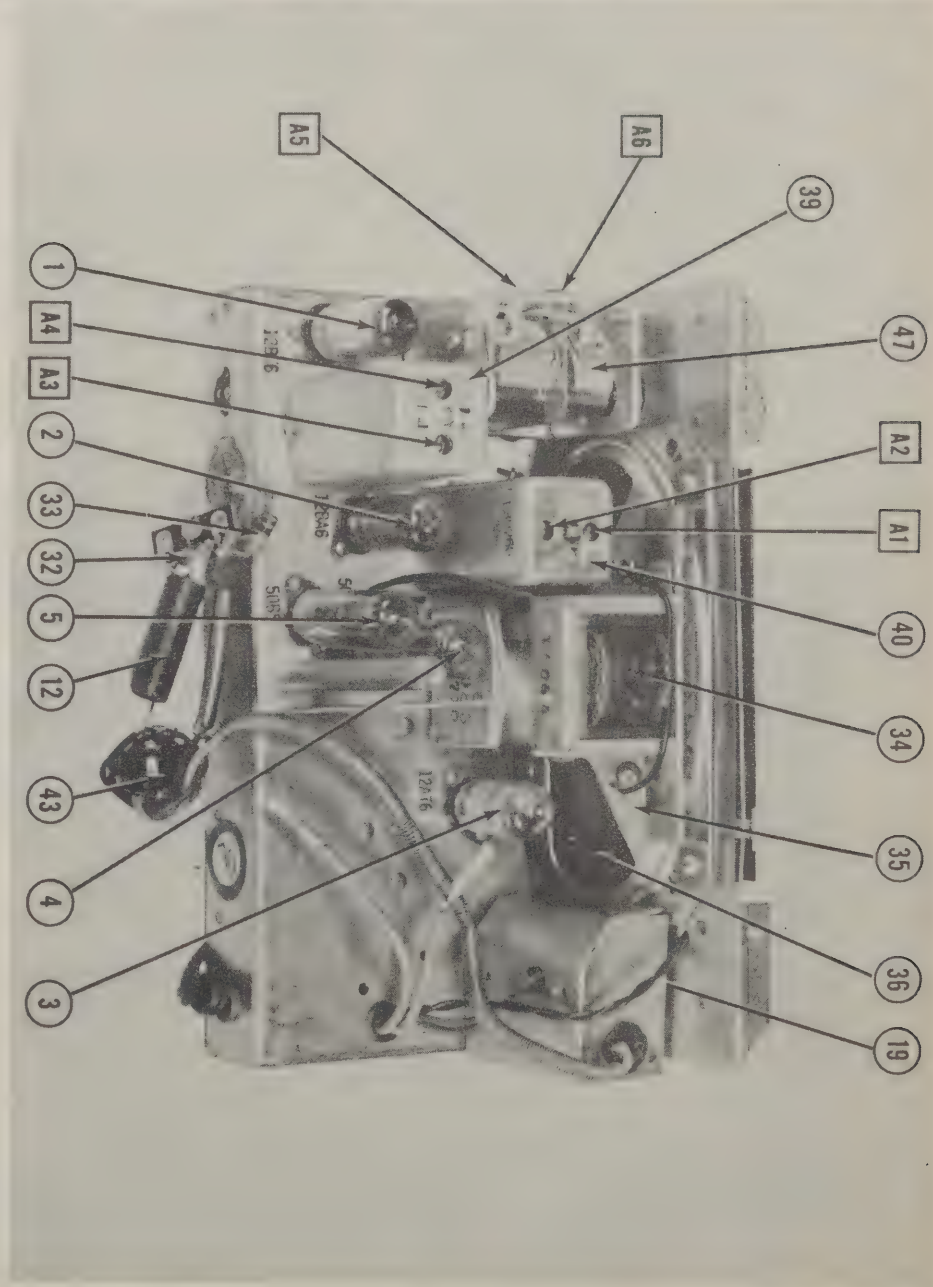
ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	REMLER PART No.	IRC PART No	
20	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Converter Grid
21	22KΩ	½		BTS-22K	Red-Red-Or. Oscillator Grid
22	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Line Isolation
23	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
24	220Ω	½		BW-½-220	Red-Red-Br. IF Cathode
25	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue AF Grid
26	220KΩ	½		BTS-220K	Red-Red-Yl. AF Plate Load
27	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
28	68Ω	1		BW-1-68	Blue-Gray-Blk. Output Cathode
29	2200Ω	1		BTA-2200	Red-Red-Red Filter
30	51Ω	½		BW-½-47	Grn.-Br.-Blk. Rectifier Ballast
31	47Ω	½		BW-½-47	Yl.-Vi.-Blk. Pilot Light Shunt-See Note 1
32	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Series Phono
33	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Phono Shunt - See Note 2

Note 1 - Not used in all models.
Note 2 - Some models use 47KΩ in this application.

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		REMLER PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
34	1700Ω	4Ω	105Ω	.5Ω	L-30264	A-3876*	T22S45*		*Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			REMLER PART No.	JENSEN PART No.		
	FIELD	VC IMP.				
35A	PM	4Ω	L-100085			
B			L-100089			Alternate Speaker
	CONE DIA.	VC DIA.				
36	4"x6"	1/2"	CONE HAS SPECIAL ADJUSTMENT FEATURE-ORDER FROM MANUFACTURER			

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA	
		PRI.	SEC.	REMLER PART No.	MEISSNER PART No.
37	Loop Ant.		2.3Ω	L-72389	
38	Osc. Coil	.7Ω	4.5Ω	L-30230	14-1040
39	Input IF	17.2Ω	17.2Ω	L-30259	14-6668
40	Output IF	16Ω	16Ω	L-30260	14-6660

DIAL LIGHT

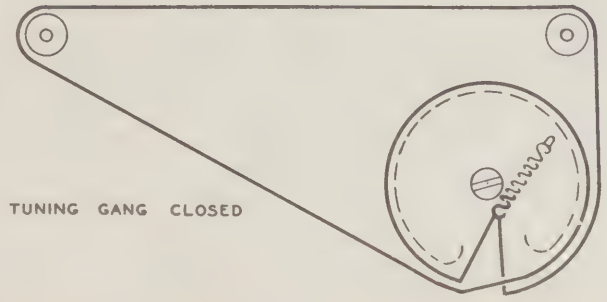
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					REMLER PART No.		
41	Bayonet	6-8	0.25A	Blue			Type 44

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA		REMARKS
	REMLER PART No.	ASTATIC PART No.	
42A		L-72	Models 5300B, 5300BI
B		QT	Model 5300I

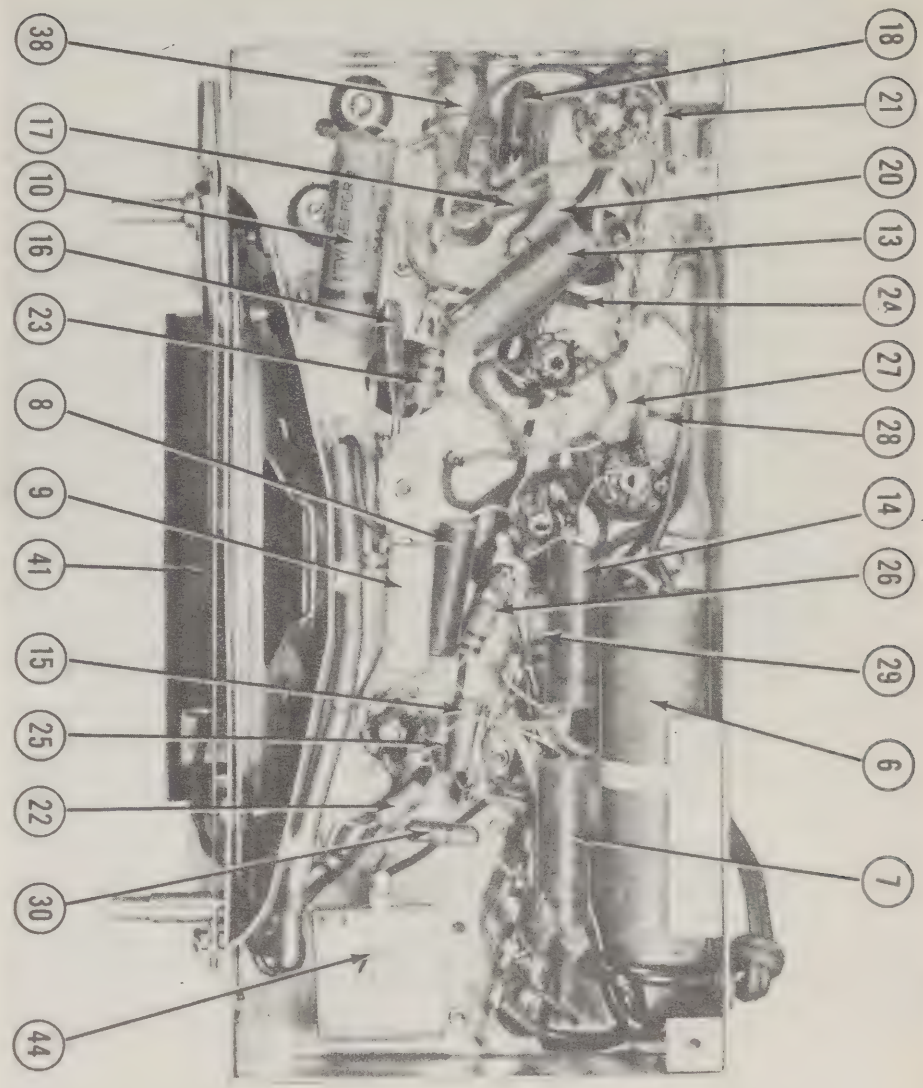
MISCELLANEOUS

ITEM No.	PART NAME	REMLER PART No.	NOTES
43	Switch	L-40191	Radio-Phono
44	Rectifier	L-30255	Selenium
45	Fuse		3 Amp.
46	"		" "
47	2 Gang Var. Cap.	L-10110	22-451 MMF, 26-193 MMF

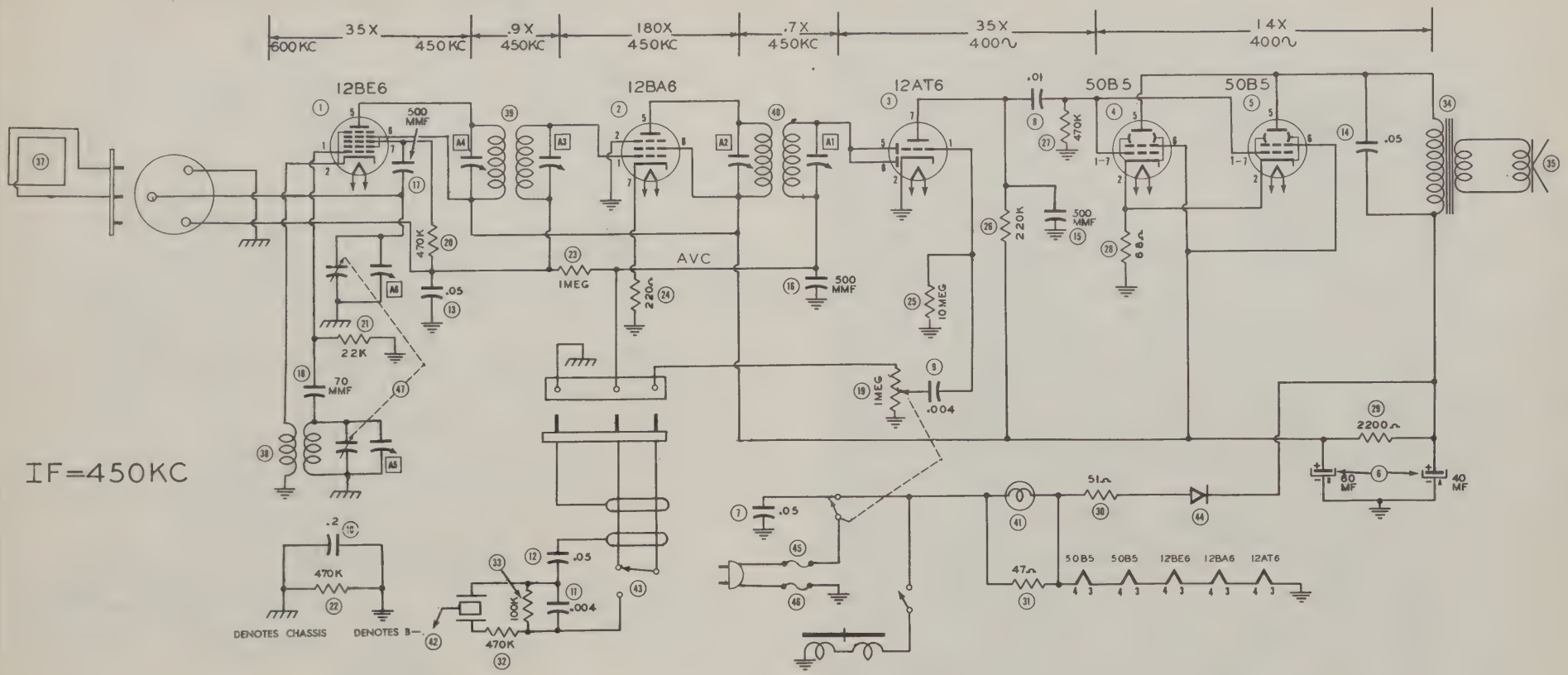


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



REMLER MODELS 5300B, 5300BI, 5300I



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	12BE6	-8VDC§	0V.	23VAC	33VAC	75VDC	75VDC	-.1VDC
2	12BA6	-.1VDC	0V.	11VAC	23VAC	75VDC	75VDC	1.2VDC
3	12AT6	-.1VDC	0V.	0V.	11VAC	-.5VDC	-.5VDC	42VDC
4	50B5	0V.	4.3VDC	33VAC	75VAC	112VDC	75VDC	0V.
5	50B5	0V.	4.3VDC	75VAC	117VDC	112VDC	75VDC	0V.

§ TAKEN WITH VACUUM-TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	12BE6	22KΩ	.6Ω	27Ω	40Ω	400KΩ	400KΩ	2.5MEG.
2	12BA6	2 MEG.	0Ω	13Ω	27Ω	400KΩ	400KΩ	220Ω
3	12AT6	10 MEG.	0Ω	0Ω	13Ω	1 MEG.	1 MEG.	620KΩ
4	50B5	500KΩ	70Ω	40Ω	90Ω	400KΩ	400KΩ	500KΩ
5	50B5	500KΩ	70Ω	90Ω	140Ω	400KΩ	400KΩ	500KΩ

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

4713-18

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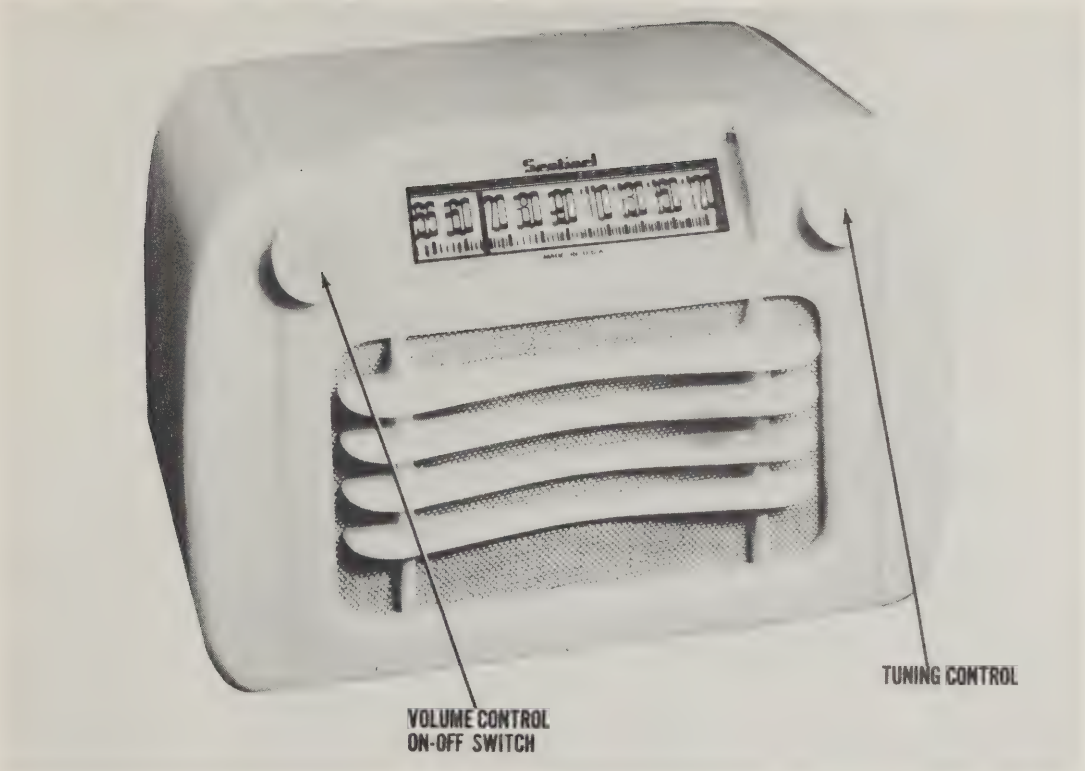
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

SENTINEL
MODELS L-284 I, L-284 NA, L-284 NI, L-284 NR, L-284 W

SENTINEL
MODELS L-284 I, L-284 NA, L-284 NI, L-284 NR, L-284 W



SENTINEL
MODELS L-284 I, L-284 NA, L-284 NI, L-284 NR, L-284 W

SENTINEL MODEL L-284NI

TRADE NAME	Sentinel, Models L-284I, L-284NA, L-284NI, L-284NR, L-284W
MANUFACTURER	Sentinel Radio Corp., 2020 Ridge Ave., Evanston, Ill.
TYPE SET	AC-DC Superheterodyne with Loop Antenna
TUBES (FIVE)	14Q7 Converter, 14A7 IF Amp., 14B6 Det.-AVC-AF, 50A5 Power Output, 35Y4 Rectifier.
POWER SUPPLY	110-120 Volts AC-DC
TUNING RANGE—BROADCAST	530-1730KC RATING .245 Amps. @ 117V AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not, connect a .1 MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.02 MFD.	High side to rear stator of tuning cap. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil.	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD. to reduce hum modulation.
2	250 MMFD	High side to ext. ant. lead. Low side to ext. ground lead.	1730KC	"	"	A5	Adjust for maximum output.
3	250 MMFD	"	1400KC	Tune for maximum output.	"	A6	" " " "

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DATE 9/47 SET 23 FOLDER 4713-19

PARTS LIST AND DESCRIPTIONS

SENTINEL MODELS L-284I, L-284MA, L-284NI, L-284NR, L-284W

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SENTINEL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	14A7	14A7	8AL	
2	IF Amp.	14A7	14A7	8V	
3	Det.-AVC-AF	14B6	14B6	8W	
4	Power Output	50A5	50A5	6AA	
5	Rectifier	35Y4	35Y4	5AL	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SENTINEL PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	50	150	25E1	UP6BJ34	FP214	DY-2x50-150	EL-25	AF1010D	■ Filter
B	50	150							▲ "
7	.05	400	23E416	DT4S5	TP426	S-4-05	TC-15	484-05	Line Filter
8	.01	400	23E211	DT4S1	TP421	S-4-01	TC-11	484-01	Output Plate Bypass
9	.01	400	23E211	DT4S1	TP421	S-4-01	TC-11	484-01	Audio Coupling
10	.01	400	23E211	DT4S1	TP421	S-4-01	TC-11	484-01	" "
11	.2	400	23E421	DT4P2	TP429	S-4-2	TC-2	484-.2	Line Isolation ‡
12	.1	400	23E418	DT4P1	TP428	S-4-1	TC-1	484-.1	AVC Filter
13	100	500	23E39	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Audio Plate Bypass
14	100	500	23E39	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Diode Filter
15	100	500	23E39	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	" "
16	100	500	23E39	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Osc. Grid Capacitor

‡Used on Underwriters approved models only.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SENTINEL PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
17A	500KΩ	1	28E-1	MK401*	D13-133*	AM-60-Z*	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 17A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

*Wrap scotch tape around shaft adjacent to guide disc for dial cord surface.

RESISTORS

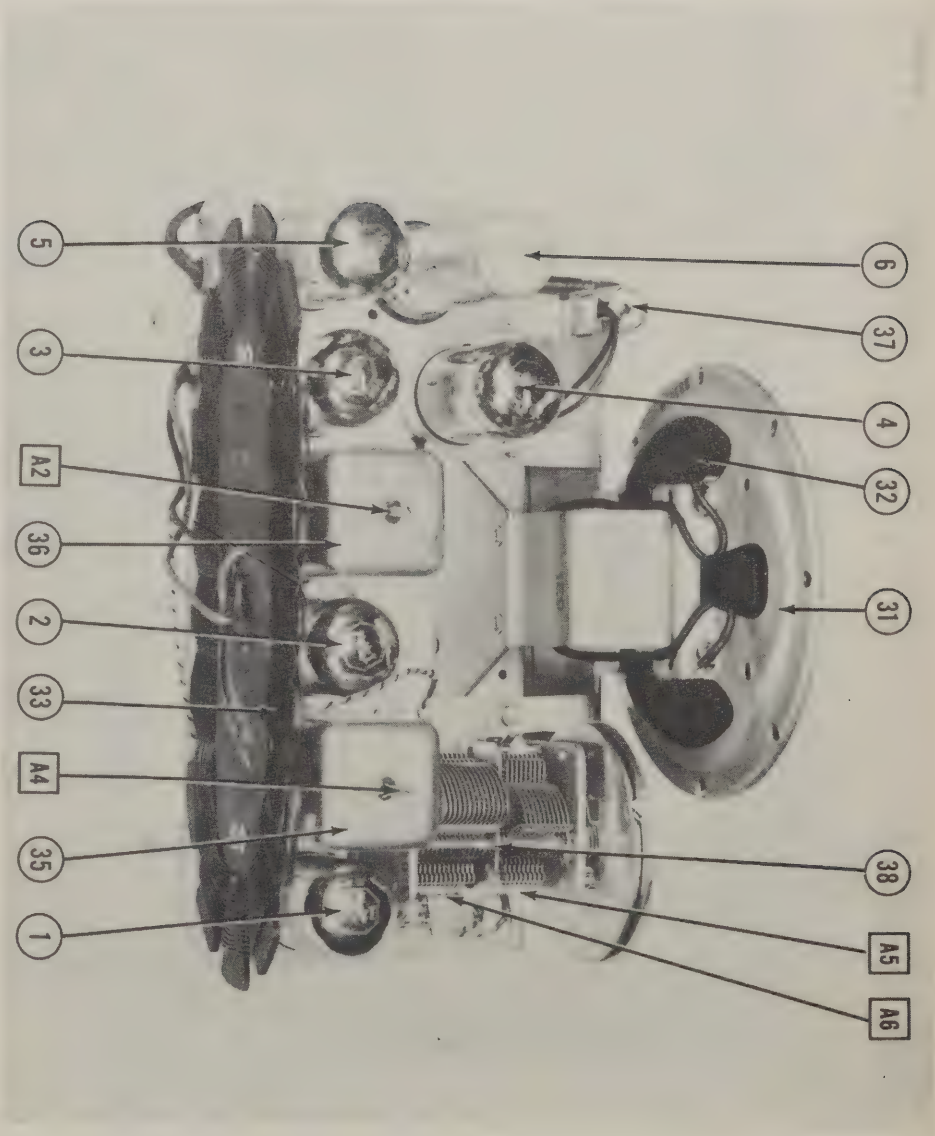
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SENTINEL PART No.	IRC PART No.	IDENTIFICATION CODES
18	22KΩ	1/3	27E223	BTS-22K	Red-Red-Or. Oscillator Grid
19	10 Meg.	1/3	27E106	BTS-10 Meg.	Br.-Blk.-Blue AVC Network
20	220KΩ	1/3	27E224	BTS-220K	Red-Red-Yl. Line Isolation-See Note
21	3.3 Meg.	1/3	27E335	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
22	68KΩ	1/3	27E683	BTS-68K	Blue-Gray-Or. Diode RF Filter
23	3.3 Meg.	1/3	27E335	BTS-3.3 Meg.	Or.-Or.-Grn. AF Grid
24	220KΩ	1/3	27E224	BTS-220K	Red-Red-Yl. AF Plate Load
25	470KΩ	1/3	27E474	BTS-470K	Yl.-Vi.-Yl. Output Grid
26	150Ω	1/3	27E151	BW-½-150	Br.-Grn.-Br. Output Cathode
27	2200Ω	1	27E222-3	BTA-2200	Red-Red-Red Filter
28	47Ω	1/2	27E470-2	BW-½-47	Yl.-Vi.-Blk. Surge Limiter
29	100Ω	1/3	27E101	BW-½-100	Br.-Blk.-Br. Pilot Light Shunt

Note-Used in Underwriters approved models only.

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SENTINEL PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
30	4970Ω	3.5Ω	237Ω	.96Ω	22E2	A-3876	T22S46		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: SENTINEL PART No.	JENSEN PART No.		INSTALLATION NOTES
31	FIELD PM	VC IMP. 3.5Ω	1E9	ST-105† Mod. P5-X		†Fabricate new mounting bracket.
32	CONE DIA. 4-5/8"	VC DIA. 1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

R F COILS

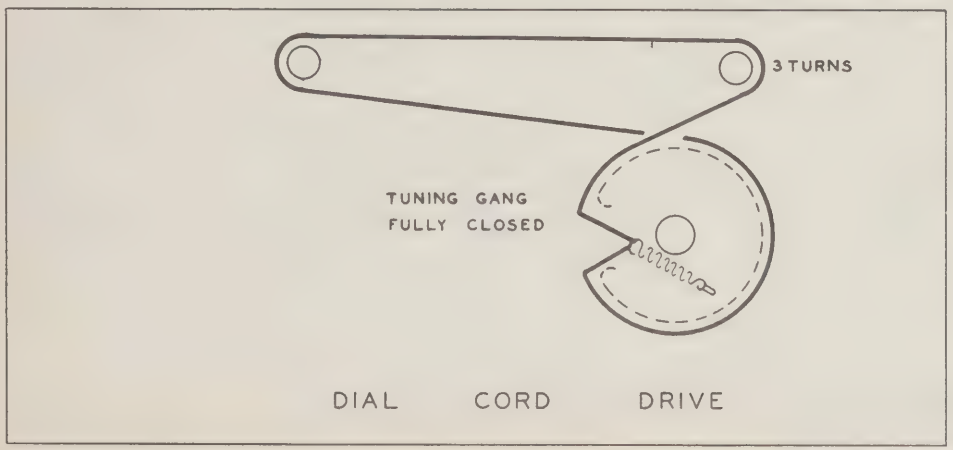
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: SENTINEL PART No.	MEISSNER PART No.	
33	Loop Ant.	0Ω	.5Ω	20E24	14-1040	Alternate Input IF Part No. is 20E261
34	Osc. Coil	.5Ω	8.5Ω	20E162		" Output " " " " 20E261-2
35	Input IF	11Ω	11Ω	20E21		
36	Output IF	11Ω	11Ω	20E22		

DIAL LIGHT

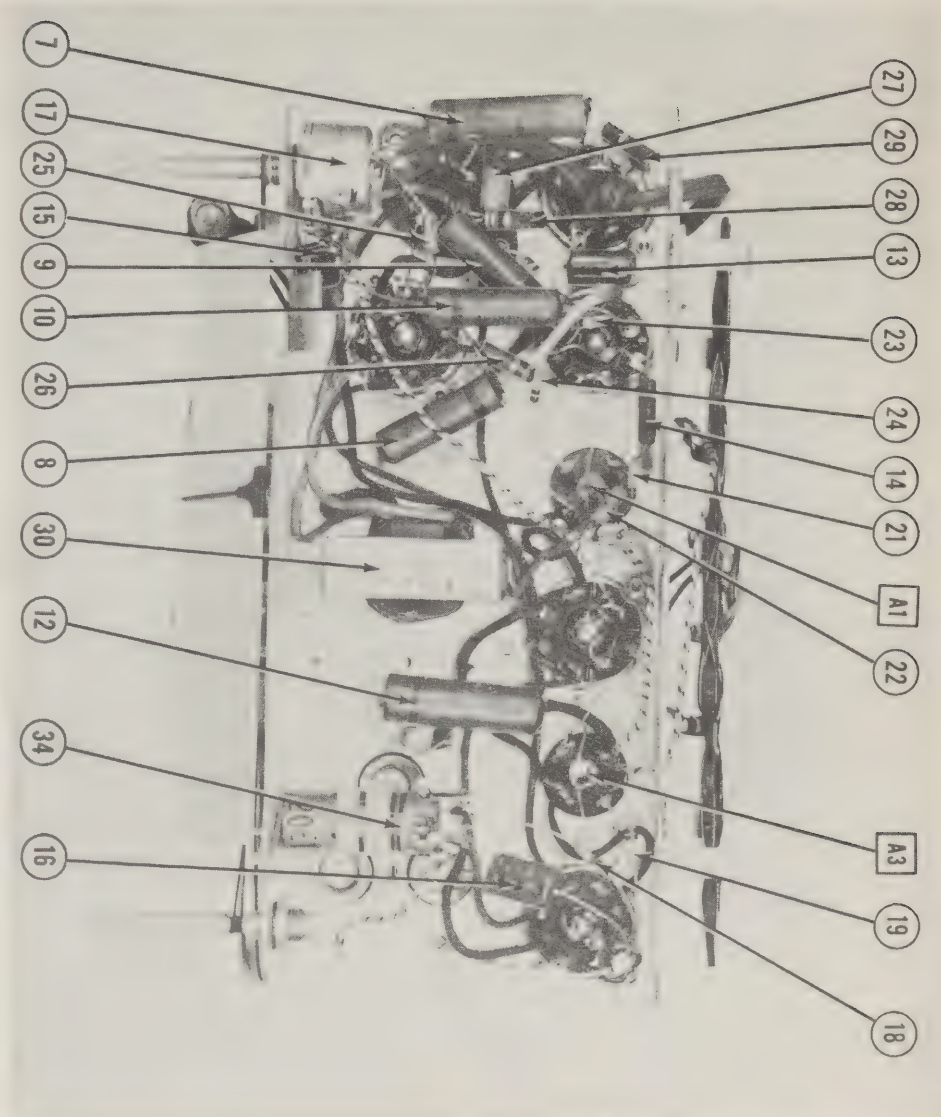
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: SENTINEL PART No.		INSTALLATION NOTES
37	Bayonet	6-8	0.15	Brown	40E1		Type 47

MISCELLANEOUS

ITEM No.	PART NAME	SENTINEL PART No.	NOTES
38A	Tuning Cap.	24E2	(39-450 MMF, 33-196 MMF) (2 Hole Mtg.)
B	" "	24E18	Alternate (3 Hole Mtg.)
	Cabinet	7E31-1	Walnut Plastic
	"	7E31-2	Ivory Plastic
	"	7E1-1	Amber Catlin
	"	7E1-5	Ivory Catlin
	"	7E1-6	Red Catlin
	Dial Crystal	9E2	
	Dial Scale	36E10	
	Dial Pointer	35E8	Indicator
	Knob	37E17-1	For Walnut Cabinet
	"	37E17-3	For Ivory Cabinet
	"	37E29-4	For Catlin Cabinet

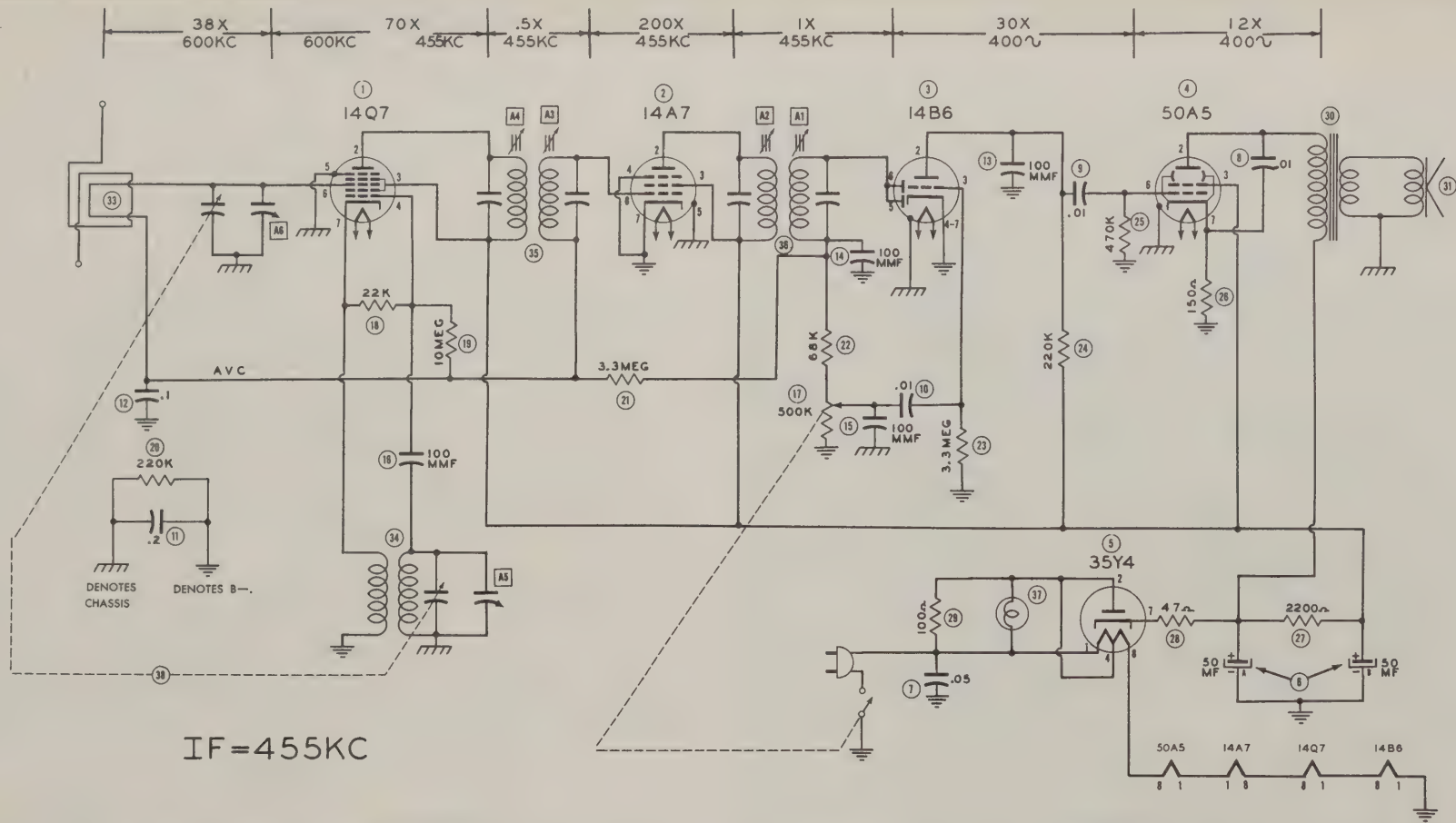


CHASSIS—BOTTOM VIEW



SENTINEL MODELS L-284I, L-284NA, L-284NI, L-284NR, L-284M

SENTINEL MODELS L-284I, L-284NA, L-284NI, L-284NR, L-284M



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	14Q7	13VAC	77VDC	77VDC	-10VDC$	0V.	-.5VDC	0V.	26VAC
2	14A7	39VAC	77VDC	77VDC	0V.	0V.	-.5VDC	0V.	26VAC
3	14B6	0V.	57VDC	-.7VDC	0V.	-.6VDC	-.6VDC	0V.	13VAC
4	50A5	39VAC	108VDC	77VDC	0V.	0V.	0V.	4.7VDC	87VAC
5	35Y4	117VAC	113VAC	0V.	113VAC	0V.	0V.	118VDC	87VAC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	14Q7	12Ω	40KΩ	40KΩ	22KΩ	0Ω	3.5 Meg.	.6Ω	25Ω
2	14A7	36Ω	40KΩ	40KΩ	0Ω	0Ω	3.5 Meg.	0Ω	25Ω
3	14B6	.0Ω	260KΩ	3.5 Meg.	0Ω	560KΩ	560KΩ	0Ω	12Ω
4	50A5	36Ω	40KΩ	40KΩ	INF	INF	450KΩ	140Ω	83Ω
5	35Y4	110Ω	108Ω	INF	108Ω	INF	INF	40KΩ	83Ω

$TAKEN WITH VACUUM TUBE VOLTMETER.

4713-19

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

SENTINEL
MODELS 286 P, 286 PR
(BATTERY OPERATED)

SENTINEL
MODELS 286 P, 286 PR
(BATTERY OPERATED)

SENTINEL MODEL 286P

TRADE NAME	Sentinel, Models 286P, 286PR
MANUFACTURER	Sentinel Radio Corp., 2020 Ridge Ave., Evanston, Ill.
TYPE SET	Three Power Portable Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types, 1R5 Converter, 1T4 IF Amp., 1S5 Det.-AVC-AF, 3Q4 Power Output, 117Z3 Rectifier.
RATING	.170 Amps. @ 117V AC or 260MA @ 1½V DC and 10MA @ 67½V DC
POWER SUPPLY	110-120 Volts AC-DC or 1½ Volt "A" Supply and 67½ Volt "B" Supply
TUNING RANGE—BROADCAST	540KC to 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Remove chassis from cabinet and connect 1 meg. resistor across loop connections. Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1 MFD capacitor in series with the low side of the signal generator and B-. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting. After chassis is reinstalled in cabinet turn tuning capacitor fully closed and set tuning drum so that bottom edge of large 5 of 55 falls under calibration marker.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.2 MFD.	High side to Pin 6 (grid) of 1R5. Low side to chassis.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy ant. to 200 MMF to reduce hum modulation.
2	.2 MFD.	"	1620KC	"	"	A5	Adjust for maximum output.
3		Loop	1400KC	Tune for maximum output.	"	A6	Replace chassis in cabinet and connect loop. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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DATE 9/47 SET 23 FOLDER 4713-20

PARTS LIST AND DESCRIPTIONS

SENTINEL MODELS 286P, 286PR

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SENTINEL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	1R5	1R5	7AT	
2	IF Amp.	1T4	1T4	6AR	
3	Det.-AVC-AF	1S5	1S5	6AU	
4	Power Output	3Q4	3Q4	7BA	
5	Rectifier	117Z3	117Z3	4BR	Used in Model 286P only.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SENTINEL PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: SOLAR PART No.	REPLACEMENT DATA: SPRAGUE PART No.	REPLACEMENT DATA: AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	40	150	25E13	BRD4415	2N511	M-2x40-150	TA-440	PRSA150-40-40	Filter - Yellow
B	40	150						"	- Red
7	100	10	25E12	BRH121	TC2501	M-100-10	UHC-112		Filament Bypass
8	.05	400	23E416	DT4S5	TP426	S-4-05	TC-15		Line Filter
9	.002	150	23E2004-2	ZY2D2	MT107	TTF15-002			Output Plate Bypass
10	.01	150	23E2004-5	ZY1S1	MT125	TTF15-01			Audio Coupling
11	.01	150	23E2004-5	ZY1S1	MT125	TTF15-01			Audio Screen Bypass
12	.01	150	23E2004-5	ZY1S1	MT125	TTF15-01			Audio Coupling
13	.01	150	23E2004-5	ZY1S1	MT125	TTF15-01			IF Screen Bypass
14	.1	150	23E2004-8	ZY1P1	MT145	TTF15-1			Filament Bypass
15	.01	150	23E2004-5	ZY1S1	MT125	TTF15-01			Feedback
16	.1	150	23E2004-8	ZY1P1	MT145	TTF15-1			Filament Bypass
17	.05	150	23E2004-7	ZY1S5	MT135	TTF15-05			AVC Filter
18	100	500	23E9	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Output Grid Filter
19	100	500	23E9	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Diode Filter
20	100	500	23E9	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Osc. Grid Capacitor
21	25	500	23E8	5W5Q25	MC220	MO.5-425	MS-425	1468-000025	Fixed Trimmer

CONTROLS

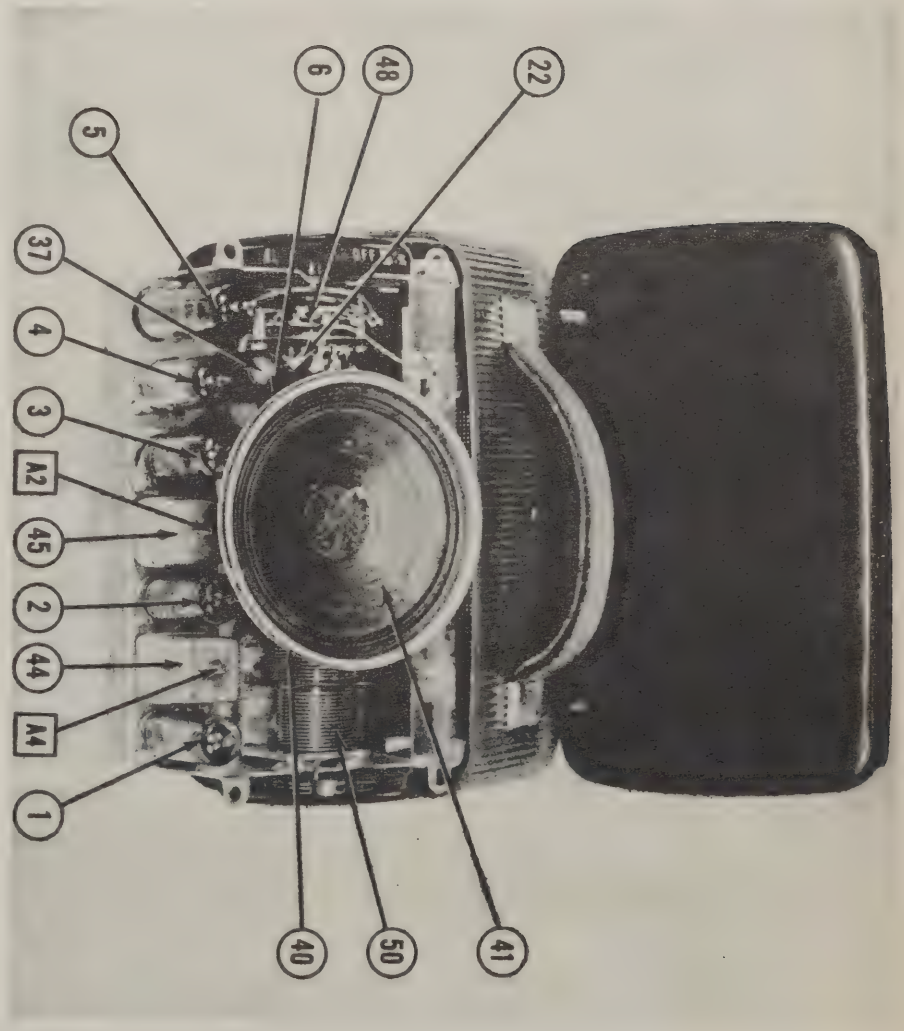
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SENTINEL PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
22A	2 Meg.	1	28E14		D13-139		Volume Control
B	Shaft				J		Attach to 22A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SENTINEL PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
23	68KΩ	½	27E683-7	BTS-68K	Blue-Gray-Or. Oscillator Grid
24	470Ω	½	27E471-7	BTS-470	Yl.-Vi.-Br. Filament String
25	6800Ω	½	27E682-7	BTS-6800	Blue-Gray-Red Converter Screen
26	4.7 Meg.	½	27E475-7	BTS-4.7 Meg.	Yl.-Vi.-Grn. AVC Network
27	10 Meg.	½	27E106-7	BTS-10 Meg.	Br.-Blk.-Blue AVC Network
28	4.7 Meg.	½	27E475-7	BTS-4.7 Meg.	Yl.-Vi.-Grn. AVC Network
29	560Ω	½	27E561-7	BTS-560	Grn.-Blue-Br. Filament String
30	4.7 Meg.	½	27E475-7	BTS-4.7 Meg.	Yl.-Vi.-Grn. AF Grid
31	4.7 Meg.	½	27E475-7	BTS-4.7 Meg.	Yl.-Vi.-Grn. AF Screen Dropping
32	1 Meg.	½	27E105-7	BTS-1 Meg.	Br.-Blk.-Grn. AF Plate Load
33	1 Meg.	½	27E105-7	BTS-1 Meg.	Br.-Blk.-Grn. Output Grid
34	100Ω	½	27E101-7	BW-½-100	Br.-Blk.-Br. Bias Network
35	270Ω	½	27E271-7	BW-½-270	Red-Vi.-Br. " "
36	68Ω	½	27E680-2	BW-½-68	Blue-Gray-Blk. Surge Limiter-See Note 1
37A	610Ω	7	27E1003	ABA-2500	Filter - See Note 2
B	1750Ω				Filament String
38	22KΩ	½	27E223-7	BTS-22K	Red-Red-Or. IF Screen Dropping

Note 1 - Used only in model 286PR.
Note 2 - On IRC replacement set one slider at 1750Ω and another at 2360Ω from one end.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		SENTINEL PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
39	6700Ω	3.1Ω	580Ω	.5Ω	22E16				

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			SENTINEL PART No.	JENSEN PART No.		
40	FIELD PI.	VC IMP. 3.1Ω	1E19			
41	CONE DIA. 4"	VC DIA. 7/8"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	SENTINEL PART No.	MEISSNER PART No.	
42	Loop Ant.		9Ω	20E134		
43	Osc. Coil	1.5Ω	4.5Ω	20E127	14-1040	
44	Input IF	18Ω	18Ω	20E125	16-6668	
45	Output IF	18Ω	18Ω	20E125	16-6669	

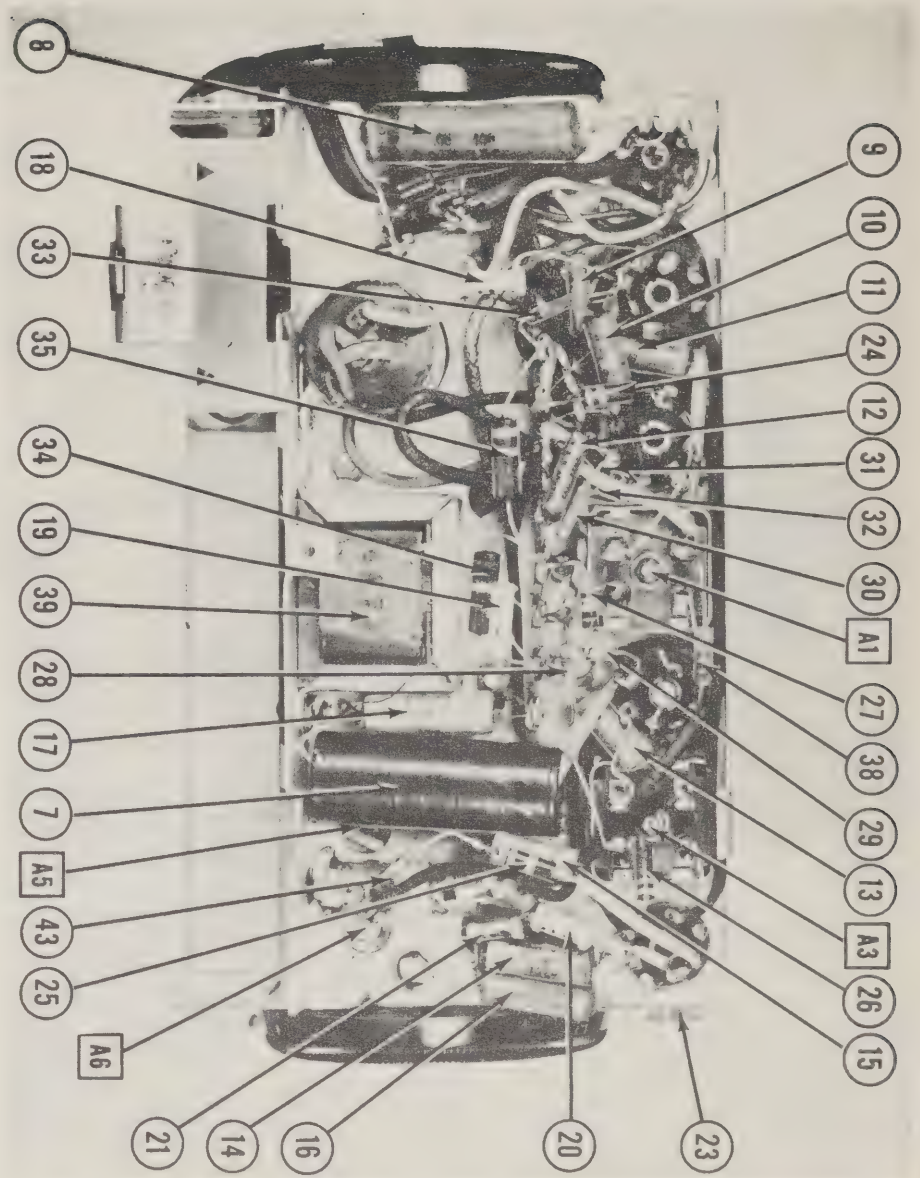
BATTERIES

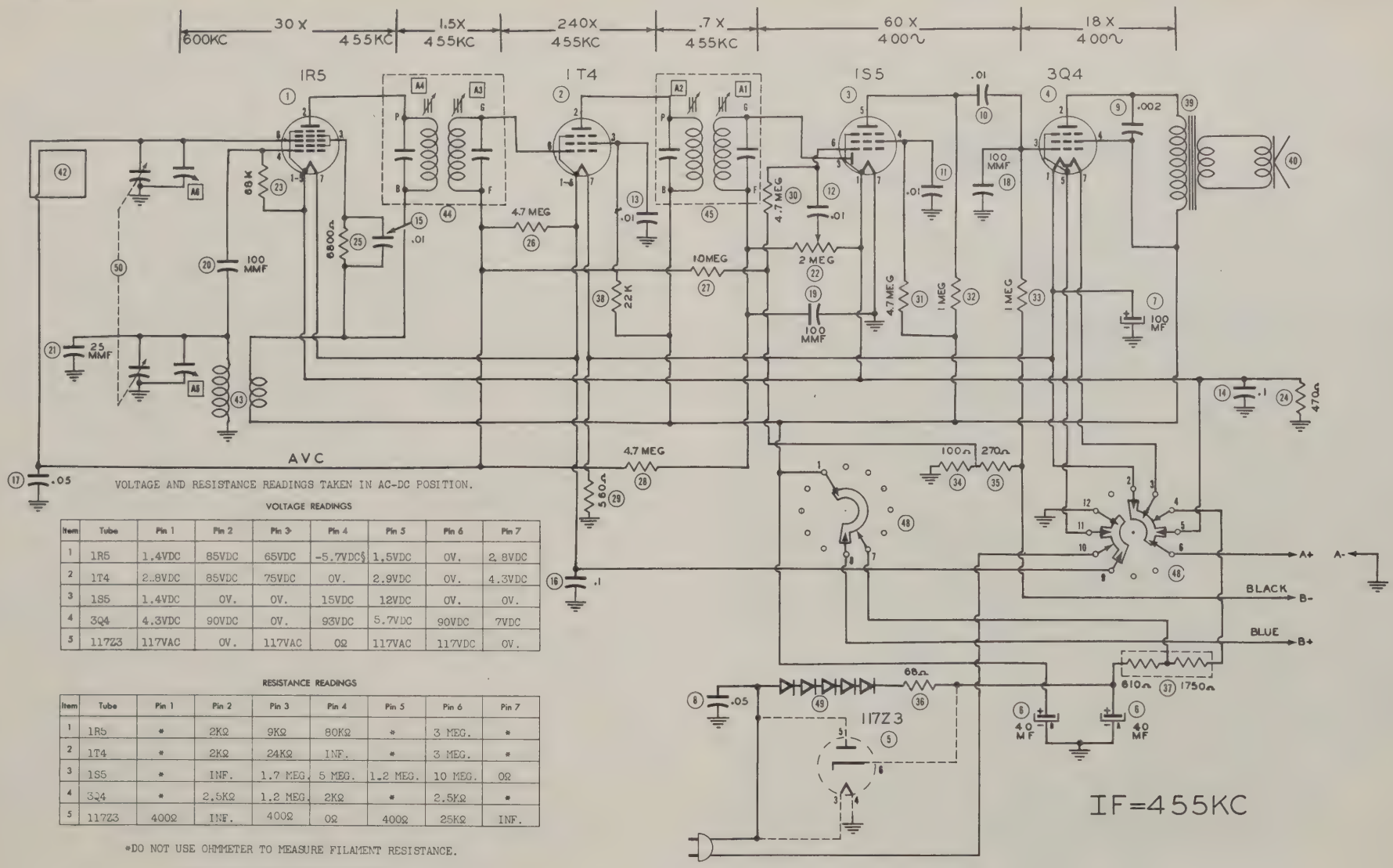
ITEM No.	VOLTAGE	SENTINEL PART No.	EVEREADY			INSTALLATION NOTES
			"A"	"B"	"A-B"	
46	1½ Volt	A2	#750			2 Used in Parallel
47	67½ Volt	B7634		#467		

MISCELLANEOUS

ITEM No.	PART NAME	SENTINEL PART No.	NOTES
48	Switch	29E11	Power Selector
49	Rectifier	57E1 or 57E1-4	Selenium (Used in Model 286PR only)
50	Tuning Capacitor	24E20	(30-503 MMF, 22-267 MMF)
	Knob	37E44-1	Calibrated Dial
	"	37E34-1	"Off-AC-DC-Batt."
	"	37E30-1	Tuning & Volume

CHASSIS—BOTTOM VIEW





VOLTAGE AND RESISTANCE READINGS TAKEN IN AC-DC POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	1.4VDC	85VDC	65VDC	-5.7VDC$	1.5VDC	0V.	2.8VDC
2	1T4	2..8VDC	85VDC	75VDC	0V.	2.9VDC	0V.	4.3VDC
3	1S5	1.4VDC	0V.	0V.	15VDC	12VDC	0V.	0V.
4	3Q4	4.3VDC	90VDC	0V.	93VDC	5.7VDC	90VDC	7VDC
5	117Z3	117VAC	0V.	117VAC	0Ω	117VAC	117VDC	0V.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	*	2KΩ	9KΩ	80KΩ	*	3 MEG.	*
2	1T4	*	2KΩ	24KΩ	INF.	*	3 MEG.	*
3	1S5	*	INF.	1.7 MEG.	5 MEG.	1.2 MEG.	10 MEG.	0Ω
4	3Q4	*	2.5KΩ	1.2 MEG.	2KΩ	*	2.5KΩ	*
5	117Z3	400Ω	INF.	400Ω	0Ω	400Ω	25KΩ	INF.

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

$TAKEN WITH VACUUM-TUBE VOLTMETER.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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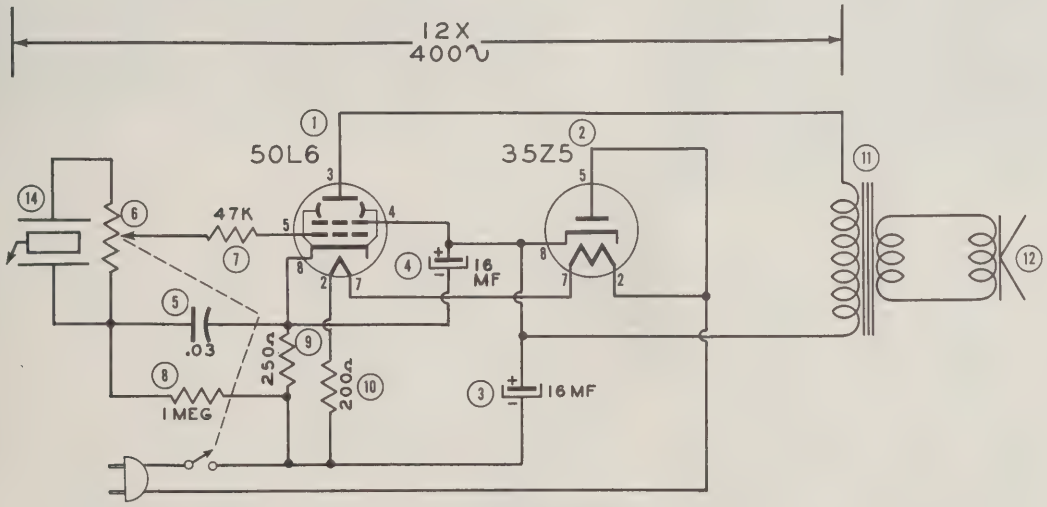
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting volume control.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage meaintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

SILVERTONE
MODEL 7145 (CH. 436.200)

SILVERTONE MODEL 7145

TRADE NAME	Silvertone, Model 7145 (Ch. 436.200)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan St., Chicago, Ill.
TYPE SET	AC Operated Phonograph with 2 Tube Amplifier & Speaker
TUBES (TWO)	Types, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	110-120 Volts AC RATING .220 Amp. @ 117 Volts AC



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	50L6GT	0V.	32VAC	127VDC	135VDC	0V.	0V.	85VAC	11VDC
2	35Z5GT	0V.	117VAC	113VAC	0V.	117VAC	0V.	85VAC	135VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	50L6GT	INF	200Ω	1 Meg.	1 Meg.	2.2 Meg.	INF	250Ω	260Ω
2	35Z5GT	INF	300Ω	290Ω	INF	300Ω	INF	250Ω	1 Meg.

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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DATE 9/47 SET 23 FOLDER 4713-21

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT		
1	Power Output	50L6GT	50L6GT	7AC	
2	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	SILVERTONE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	
3	16	150		BR1615	TC45	M-16-150	UT-161	PRS150-16	Filter
4	16	150		BR1615	TC45	M-16-150	UT-161	PRS150-16	"
5	.03	400		DT4S3	TP424	S-6-03	TC-13	484-03	Cathode Bypass

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
6A	1 Meg.	1	UC-125	MR53	D13-137	M-63-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 6A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	SILVERTONE PART No.	IRC PART No.	
7	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Series AF Grid
8	1 Meg.	½		BTS-1 Meg.	Brn.-Grn.-Blk. Phono Isolation
9	250Ω	1		BW-1-270	Red-Grn.-Brn. Output Cathode
10	200Ω	10		AB-200	Line Dropping

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		SILVERTONE PART No.	STANCOR PART No.	THORDARSON PART No.		
	PRI.	SEC.	PRI.	SEC.					
11	2200Ω	3.2Ω	168Ω	.6Ω	UA-750	A-3876	T22S45		

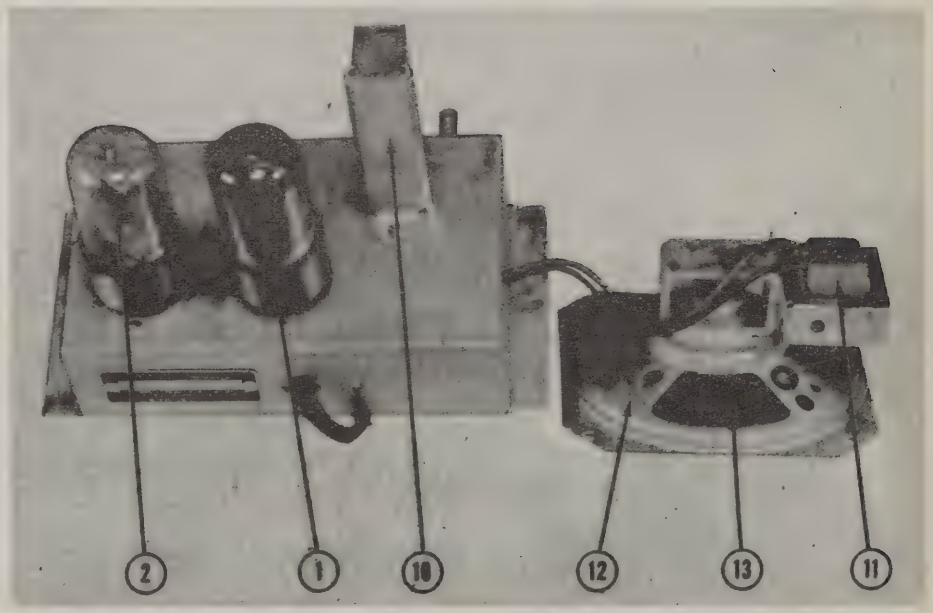
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			SILVERTONE PART No.	JENSEN PART No.		
12	FIELD	VC IMP.	UB-41C	ST-113		
	PM	3.2Ω		Mod. P4-X		
13	CONE DIA.	VC DIA.	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			
	4"	1/2"				

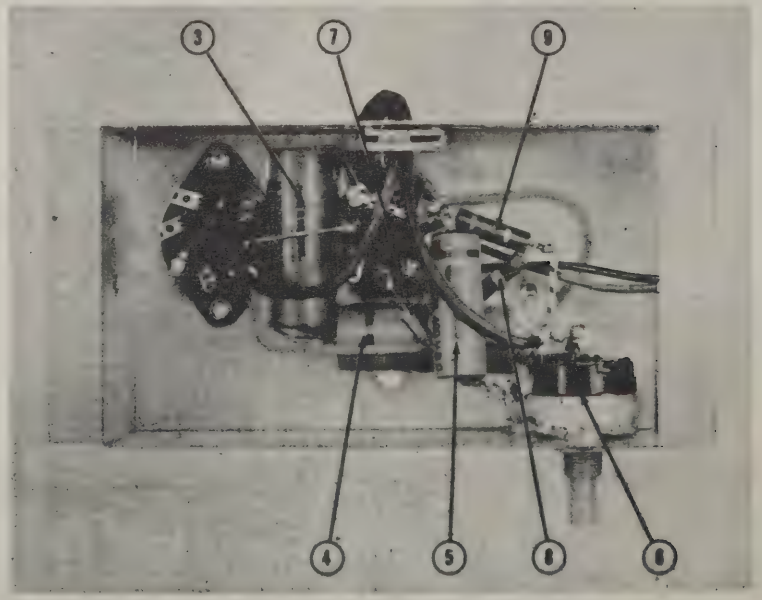
PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA		REMARKS
	SILVERTONE PART No.	ASTATIC PART No.	
14		L-72-A	

CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW

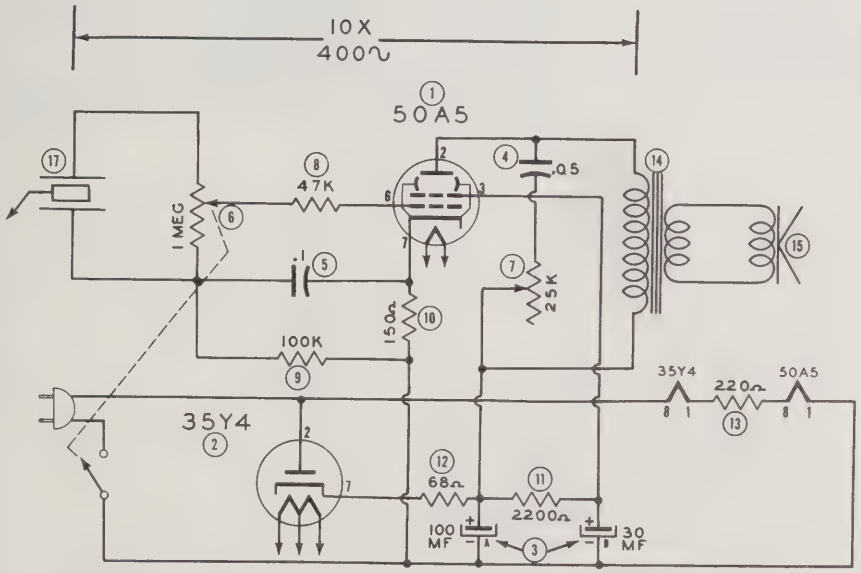


SILVERTONE
MODELS 7148 (CH. 431.188)
7148 A (CH. 431.188-1)

SILVERTONE
MODELS 7148 (CH. 431.188)
7148 A (CH. 431.188-1)

SILVERTONE MODEL 7148

TRADE NAME	Silvertone, Models 7148 (Ch. 431.188), 7148A (Ch. 431.188-1).
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan St., Chicago
TYPE SET	AC Operated Portable Phonograph with 2 Tube Amplifier & Speaker
TUBES (TWO)	Types, 50A5 Power Output, 35Y4 Rectifier.
POWER SUPPLY	110-120 Volts AC RATING · .220 Amp. @ 117 Volts AC



Pin No.	50A5 Volt.	Res.
1	0V.	0Ω
2	117VDC	75KΩ
3	107VDC	75KΩ
4	0V.	INF
5	125VDC	75KΩ
6	0V.	1.3 Meg.
7	6.8VDC	160Ω
8	50VAC	50Ω

Pin No.	35Y4 Volt.	Res.
1	85VAC	280Ω
2	117VAC	320Ω
3	6.8VDC	160Ω
4	92VAC	285Ω
5	125VDC	60KΩ
6	125VDC	60KΩ
7	125VDC	60KΩ
8	117VAC	320Ω

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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4713-22

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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DATE 9/47 SET 23 FOLDER 4713-22

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Power Output	50A5	50A5	6AA	
2	Rectifier	35Y4	35Y4	5AL	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
3A	100	150	YA-8C-880		2N521*	DSB-8040-150	EL-452*		Filter - Red
B	30	150			TC47				" - Green
4	.05	400		DT4S5	TP426	S-4-05	TC-15	484-05	Tone Compensation
5	.1	400		DT4P1	TP428	S-4-1	TC-1	484-.1	Cath. Bypass

*Parallel two sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
6A	1 Meg.	1	YA-10A-821	MR53	D13-137	M-63-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 6A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
7A	25KΩ	1	YA-11B-820	MR29		M-41-W	Tone Control
B	Shaft		Not Req.	Not Req.		Not Req.	Attach to 7A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
8	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Series Grid
9	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Output Grid
10	150Ω	½		BW-½-150	Br.-Grn.-Br. Output Cathode
11	2200Ω	½		BTS-2200	Red-Red-Red Filter
12	68Ω	½		BW-½-68	Blue-Gray-Blk. Surge Limiter-See Note 1
13	220Ω	8		ABA-250	Line Dropping-See Note 2

Note 1 - Some models use 100Ω in this application. IRC replacement BW-½-100.
Note 2 - On IRC replacement set slider 220Ω from one end.

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDARSON PART No.		INSTALLATION NOTES
14	1900Ω	3.6Ω	170Ω	.7Ω	YB-12C-881	A-3876	T22S45		

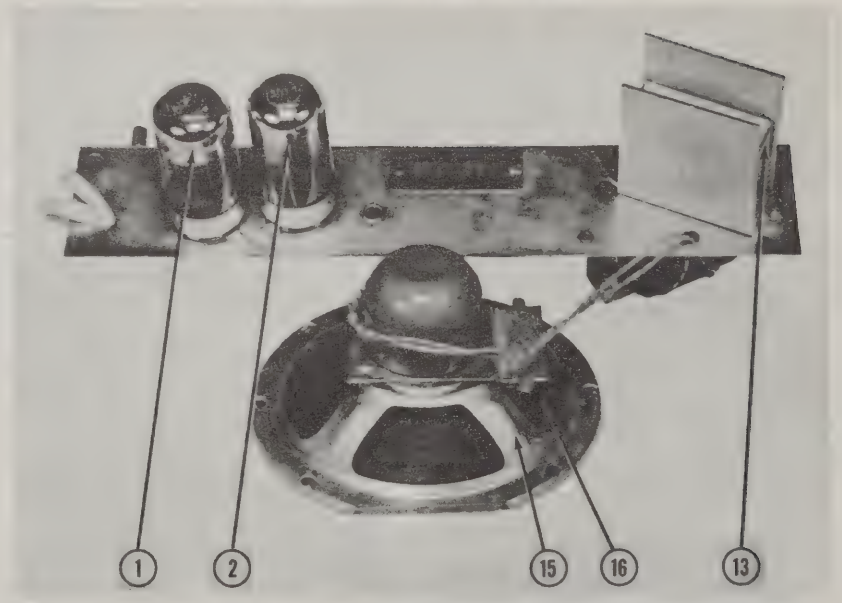
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.		ST-107*		*Trim Flange.
15	PM	3.6Ω	YB-18A-949	Mod. P5-V		
	CONE DIA.	VC DIA.				
16	4-3/4"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

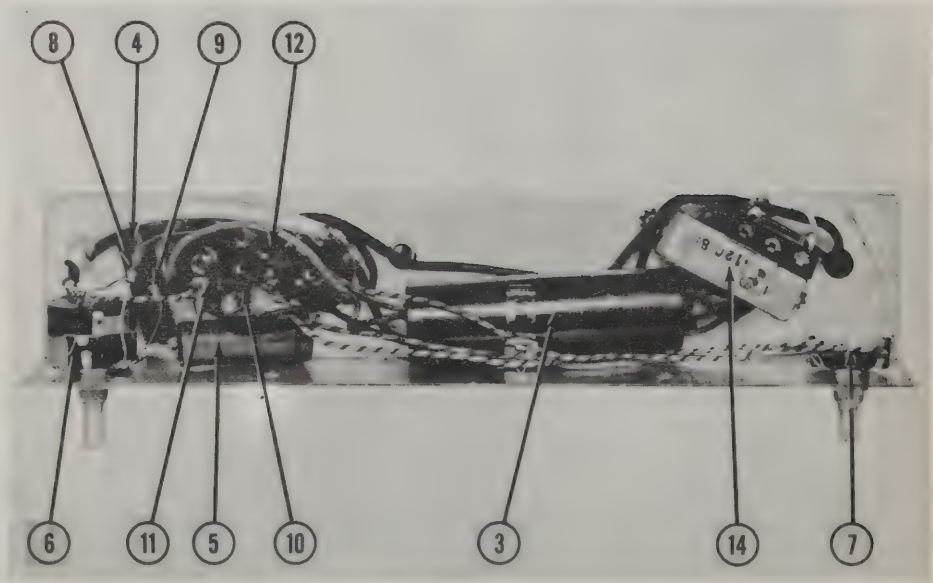
PHONO CARTRIDGE

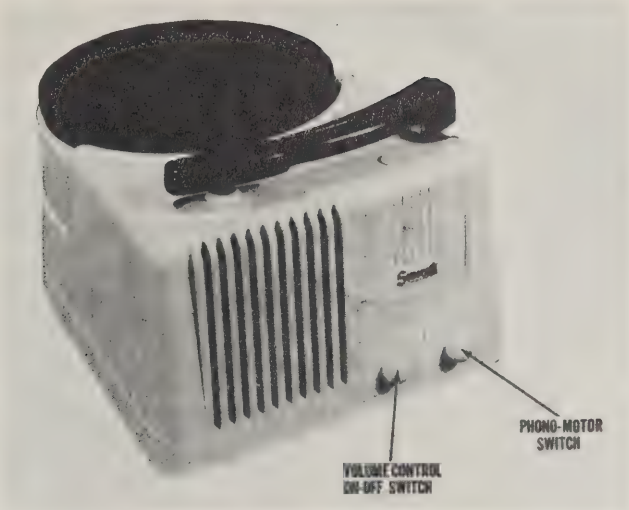
ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: ASTATIC PART No.	REMARKS
17	YA-59A-974	L-72-A	

CHASSIS—TOP VIEW



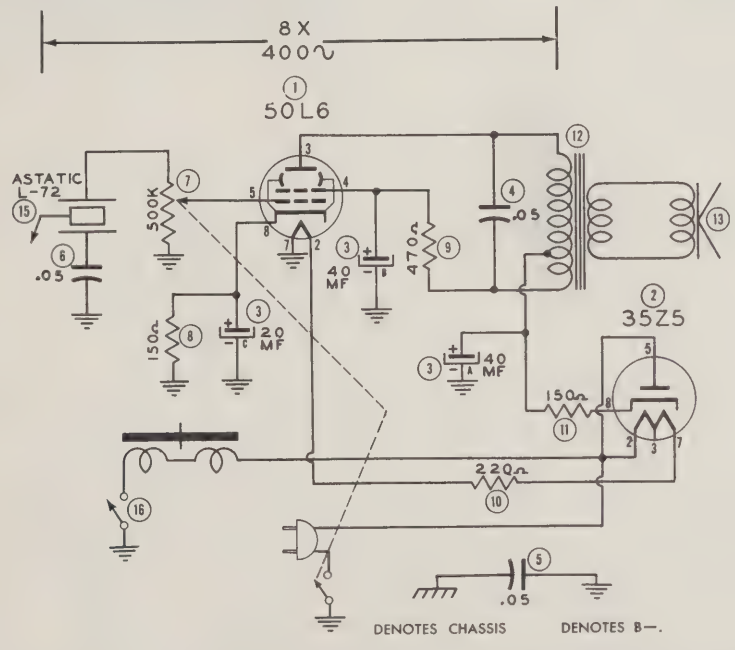
CHASSIS—BOTTOM VIEW





SONORA MODEL RWFU-238

TRADE NAME	Sonora, Model RWFU-238
MANUFACTURER	Sonora Radio & Tele. Corp., 325 N. Hoyne Ave., Chicago, Ill.
TYPE SET	AC Operated Phonograph with 2 Tube Amplifier & Speaker
TUBES (TWO)	Types, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	110-120 Volts AC RATING .220 Amp. @ 117 Volts AC



Pin No.	50L6GT Volt.	Res.
1	0V.	INF
2	0V.	0Ω
3	107VDC	50KΩ
4	110VDC	50KΩ
5	0V.	500KΩ
6	0V.	INF
7	50VAC	50Ω
8	7.1VDC	150Ω

Pin No.	35Z5GT Volt.	Res.
1	0V.	INF
2	117VAC	310Ω
3	110VAC	300Ω
4	112VDC	50KΩ
5	117VAC	310Ω
6	0V.	INF
7	84VAC	270Ω
8	118VDC	50KΩ

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4713-24

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SONORA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Power Output	50L6GT	50L6GT	7AC	
2	Rectifier	3525GT	3525GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	SONORA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
3A	40	150	N-5439	UP6CJ41	FP311	DY-305	EL-352	AF88D4A	■ Filter ▲ ■ Cathode Bypass
B	40	150							
C	20	25							
4	.05	400	N-1346	DT4S5	TP426	S-4-05	TC-15	484-05	Output Plate Bypass
5	.05	200	N-1345	DT4S5	TP426	S-4-05	TC-15	484-05	Line Isolation
6	.05	200	N-1345	DT4S5	TP426	S-4-05	TC-15	484-05	Phono Isolation

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	SONORA PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
7A	500K	1	N-3248	MK401	D-13-133	AM-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 7A per instructions
C	Switch		■ ■	M-26	41	SW-A	■ ■ ■ ■ ■

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	SONORA PART No.	IRC PART No.	IDENTIFICATION CODES
8	150Ω	½	N-3663	BW-½-150	Brn.-Grn.-Brn. Output Cathode
9	470Ω	½	N-4066	BW-½-470	Yl.-Vi.-Brn. Filter
10	220Ω	5	N-3488	ABA-250	Red-Red-Brn. Line Dropping-See Note
11	150Ω	1	N-5441	BW-1-150	Brn.-Grn.-Brn. Surge Limiter

Note - Adjust slide to 220Ω.

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	SONORA PART No.	STANCOR PART No.	THORDARSON PART No.		INSTALLATION NOTES
12	2650Ω	3.0Ω	300Ω tapped @ 13Ω	.5Ω	N-4875	A-3876*			*Add extra filter to reduce hum level.

SPEAKER

ITEM No.	RATINGS		SONORA PART No.	JENSEN PART No.		INSTALLATION NOTES
13	FIELD PM	VC IMP. 3Ω	N-4867	ST-113 Mod. P4-X		Fabricate new mounting bracket.
14	CONE DIA. 4"	VC DIA. 1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

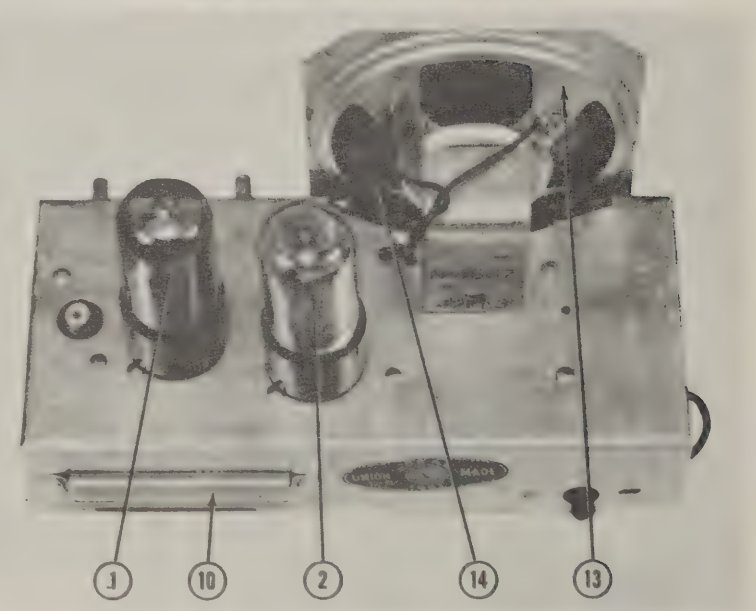
PHONO CARTRIDGE

ITEM No.	SONORA PART No.	ASTATIC PART No.	REMARKS
15		L-72	

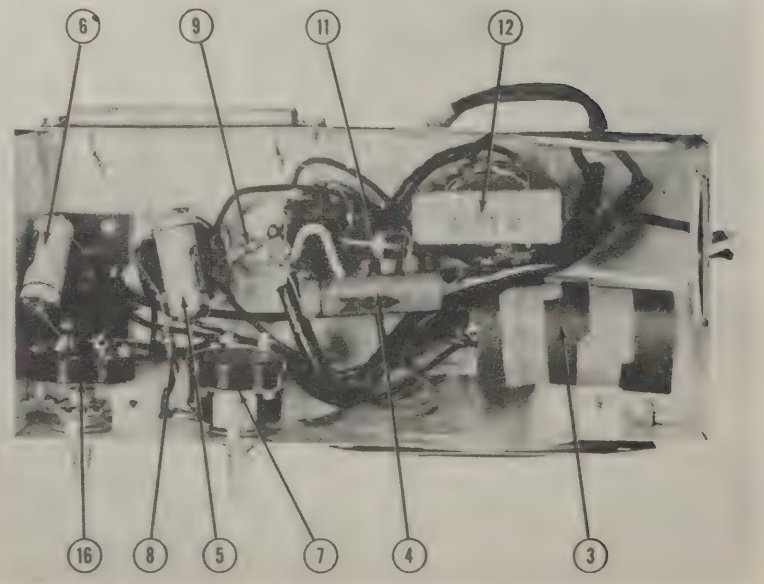
MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
16	Switch		Phono Motor

CHASSIS—TOP VIEW

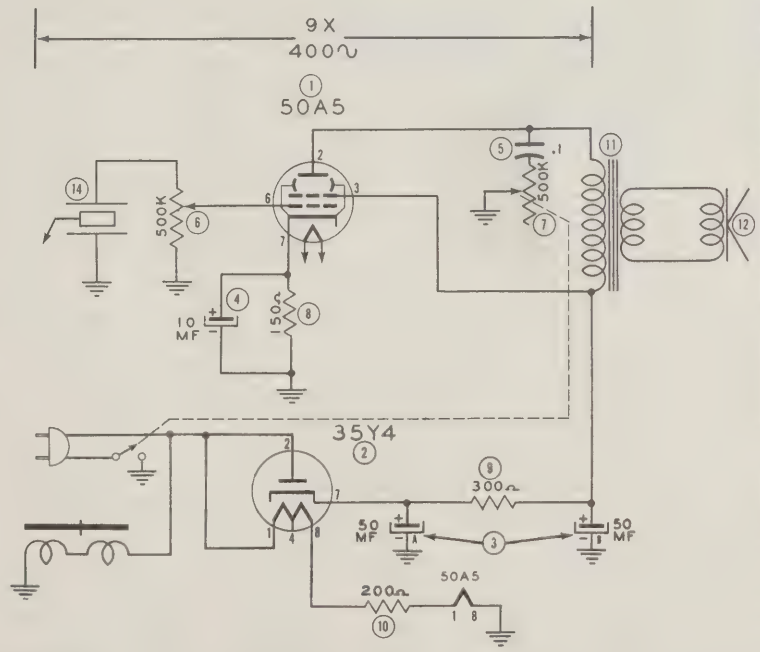


CHASSIS—BOTTOM VIEW



STEELMAN MODEL 200

TRADE NAME	Steelman, Model 200
MANUFACTURER	Steelman Radio Corp., 742 E. Tremont Ave., Bronx 57, N.Y.
TYPE SET	AC Operated Phonograph with 2-Tube Amplifier & Speaker
TUBES (TWO)	Types, 50A5 Power Output, 35Y4 Rectifier
POWER SUPPLY	110-120 Volts AC RATING .230 Amp. @ 117 Volts AC



Pin No.	50A5 Volt.	Res.
1	50VAC	52Ω
2	110VDC	40KΩ
3	115VDC	40KΩ
4	0V.	INF
5	0V.	INF
6	0V.	40 K.
7	7.5VDC	1.0Ω
8	0V.	0Ω

Pin No.	35Y4 Volt.	Res.
1	117VAC	260Ω
2	117VAC	280Ω
3	0V.	INF
4	110VAC	270Ω
5	0V.	INF
6	0V.	INF
7	127VDC	40KΩ
8	82VAC	250Ω

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Power Output	50A5	50A5	6AA	
2	Rectifier	5Y4	5Y4	5AL	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: STEELMAN PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
3A	50	150		EZ5515	2N521	DSB-2x50-150	TA-505	PRSA150-50-50	Filter - Red
B	50	150							" - "
4	10	25		BR102A	TC22	M-10-25	TA-10	PRS25-10	Cathode Bypass
5	.1	600		DT6P1	TP41c	S-6-1	TC-1	684-.1	Tone Compensation

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STEELMAN PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
6A	500KΩ	½		MR46	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 6A per instructions
7A	500KΩ	½		MR48	D13-133	M-60-Z	Tone Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 7A per instructions
C	Switch		" "	" "	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
8	150Ω	½		BW-½-150	Br.-Grn.-Br. Output Cathode
9	300Ω	1		BW-1-330	Or.-Blk.-Br. Filter
10	200Ω	10		AB-200	Line Dropping

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: STEELMAN PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
11	1500Ω	3.2Ω	80Ω	.8Ω		A-3065	T22S45		

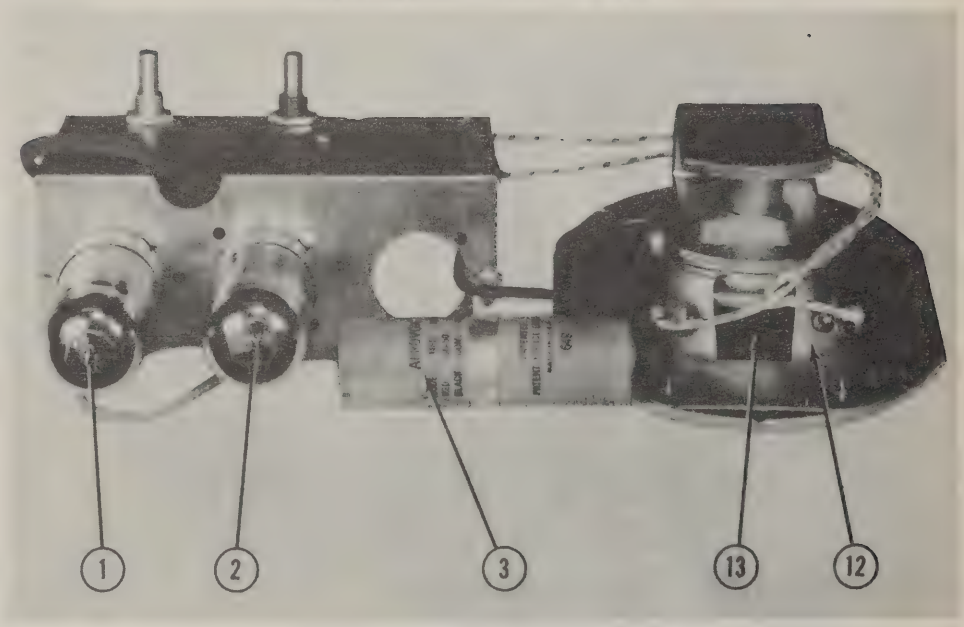
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: JENSEN PART No.		INSTALLATION NOTES
12	FIELD	VC IMP.		ST-107		
	PM	3.2Ω		Mod. P5-V		
13	CONE DIA.	VC DIA.	CONE HAS SPECIAL ADJUSTMENT FEATURE-ORDER FROM MANUFACTURER			
	4-3/4"	1/2"				

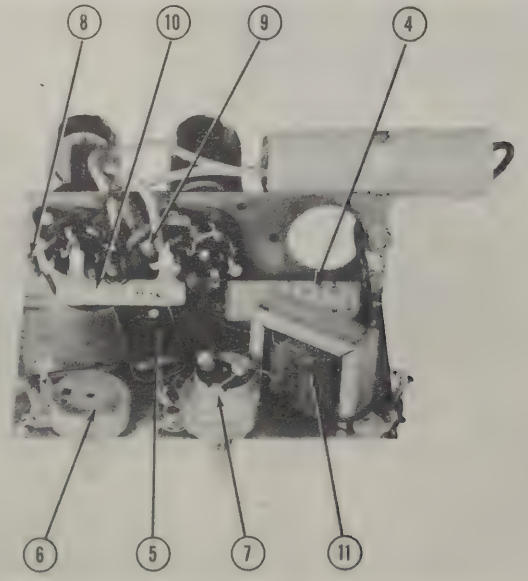
PHONO CARTRIDGE

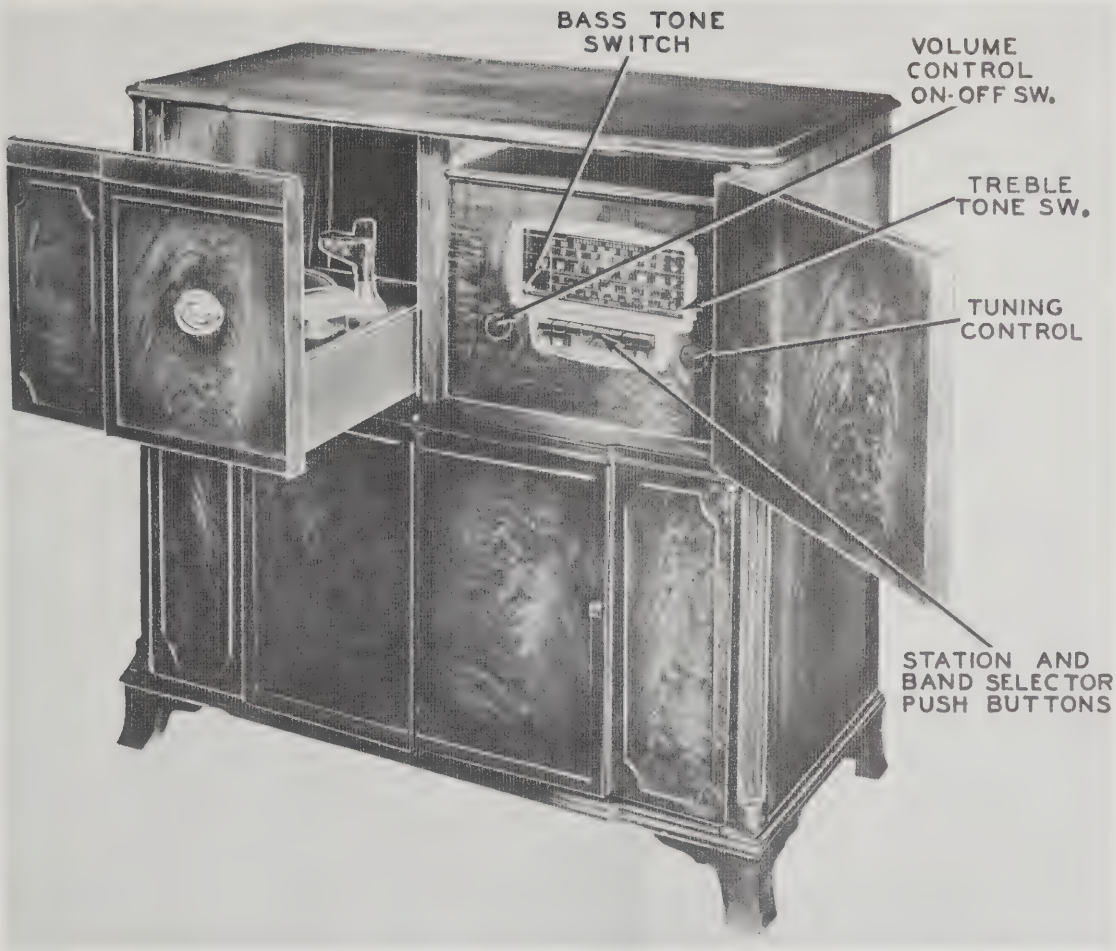
ITEM No.	REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: ASTATIC PART No.	REMARKS
14		L-72-A	

CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW





STROMBERG-CARLSON MODEL 1135PLW

TRADE NAME	Stromberg-Carlson, Model 1135PFM, 1135PLM, 1135PLW (Series Nos. 10-11)
MANUFACTURER	Stromberg-Carlson Co., 100 Carlson Rd., Rochester, N.Y.
TYPE SET	AC Operated Phono-Radio Combination FM-AM Superheterodyne Receiver with Self-Contained Loop Antenna and Pushbutton Tuning.
TUBES (SIXTEEN)	6SG7 RF Amp., 6SB7Y Converter, 6SG7 1st IF Amp., 6SH7 2nd IF Amp., 6SJ7 1st Limiter, 6SJ7 2nd Limiter, 6H6 Discriminator, 6SQ7 FM Tuning Ind. Amp., 6SL7 FM Tuning Ind. Amp., 6SQ7 AM Det.-AVC-FM Squelch, 6U5G Tuning Eye, 6SQ7 1st AF Amp., 6SN7 Phase Inv., 6L6GT Power Output, 6L6GT Power Output, 5R4G Rectifier.
POWER SUPPLY	105-125 Volts AC
RATING	1.6 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1620KC, SHORT WAVE 8.8-10.2MC, 11.2-12.6MC, FM 42-50MC, 88-108MC

STROMBERG-CARLSON
MODELS 1135 PFM, 1135 PLM, 1135 PLW

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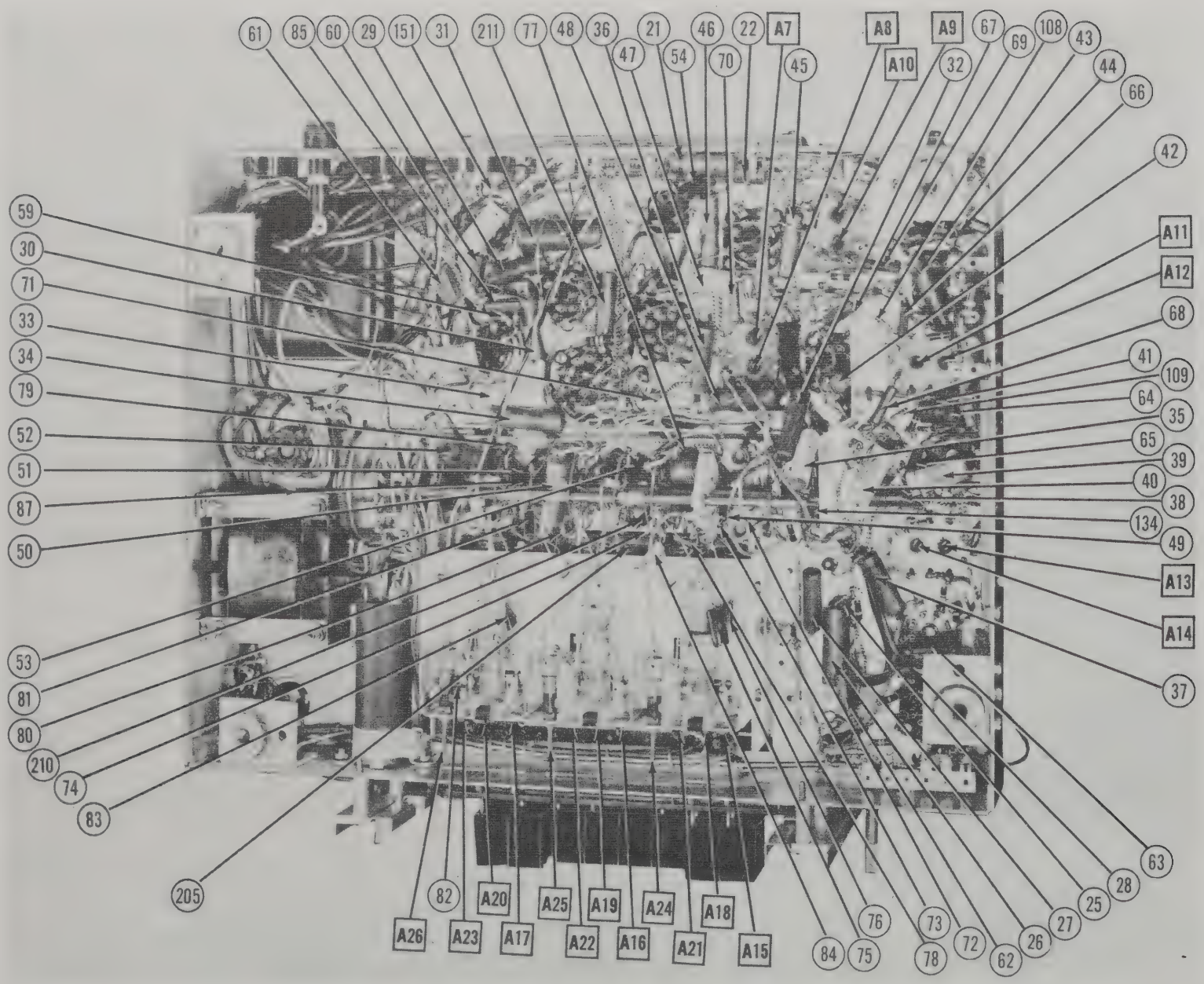
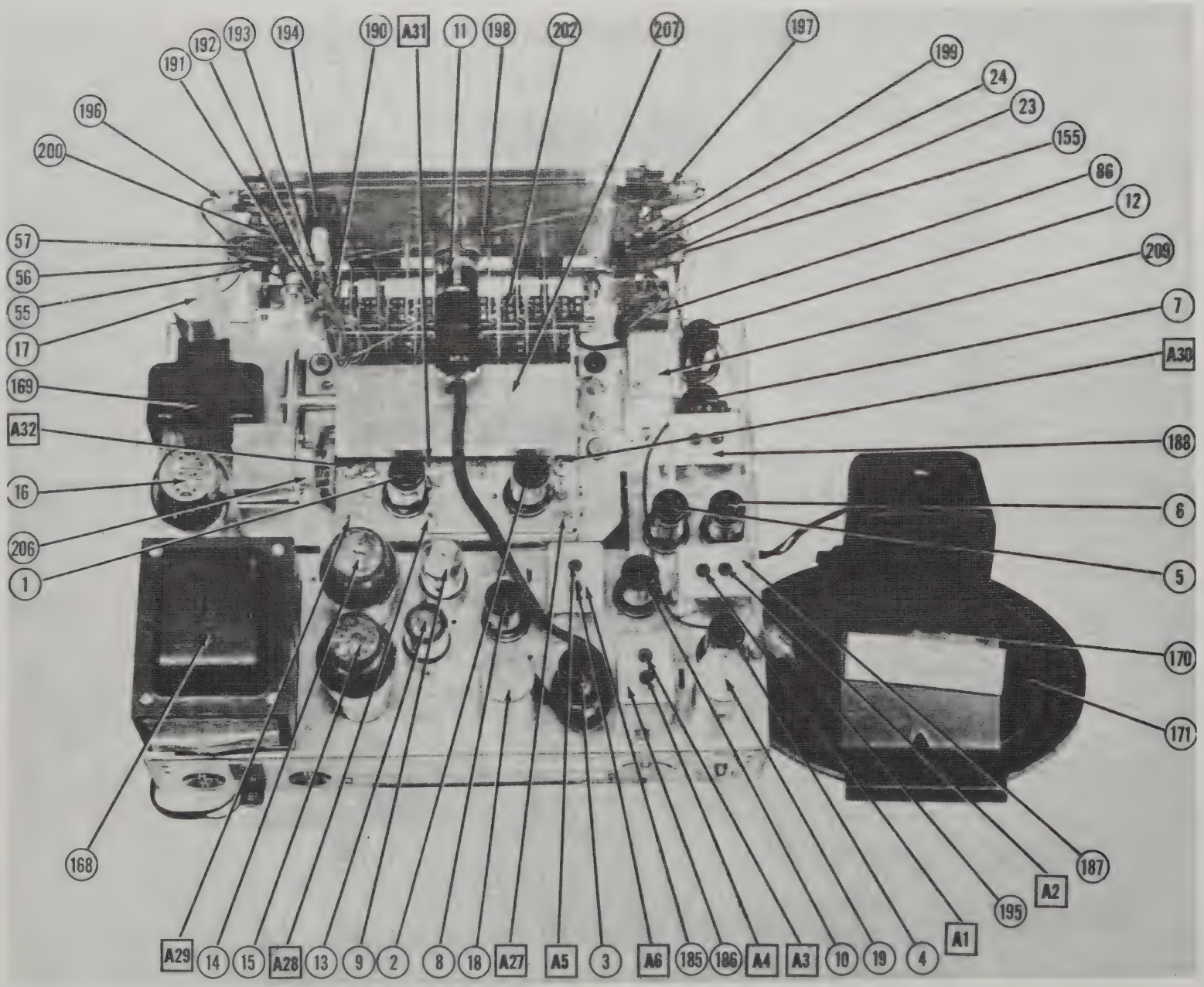
CHASSIS—BOTTOM VIEW



CHASSIS—BOTTOM VIEW

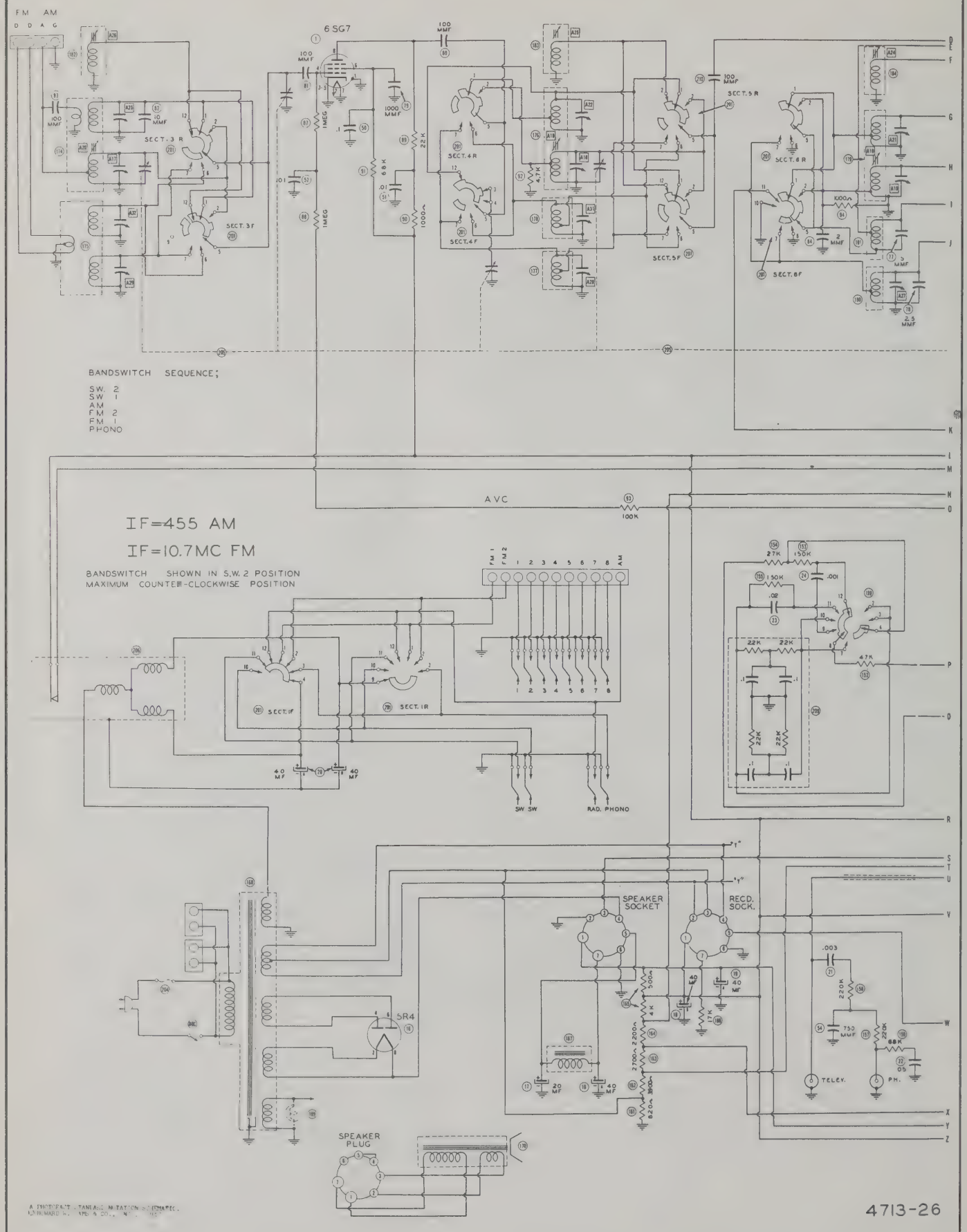
CHASSIS—TOP VIEW

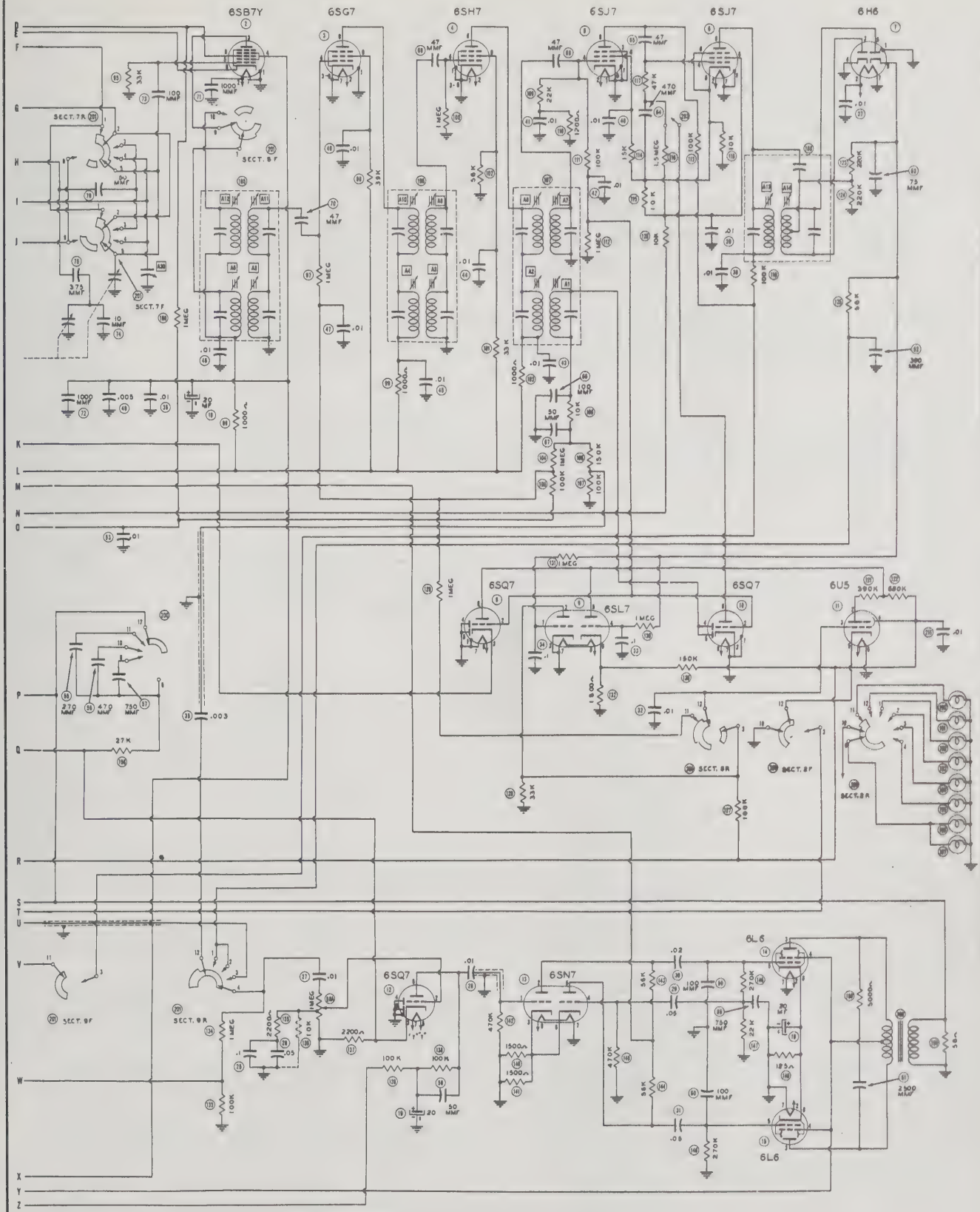


ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and align pointer with two diamonds on extreme left end of dial. Use extreme care while aligning IF cores. They are made of powdered iron and are very fragile. Use a V.T.V.M. or 20KΩ per volt DC meter for all FM adjustments. When adjusting low FM band connect high side of signal generator to left dipole terminal through 39Ω, connect low side to right dipole terminal through 39Ω and connect low side of signal generator to chassis. For adjusting high FM band reverse connection of 39Ω resistors on dipole terminals. Keep low side of signal generator connected to chassis. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
DIRECT	High side to Pin 8 (grid) 6SB7. Low side to chassis.	455KC	BC (depress radio button)	600KC	Across voice coil	A1,A2, A3,A4, A5,A6.	Adjust for maximum output
DIRECT	"	10.7MC (unmodulated)	Low FM (last button on right of row of eight)	21 on low FM band	VTVM connected from Pin 4 (grid) 6SJ7 1st limiter tube (5) to chassis	A7,A8, A9,A10, A11,A12.	Adjust for maximum deflection.
DIRECT	High side to Pin 4 (grid) 6SH7 2nd IF Tube (4). Low side to chassis.	"	"	"	VTVM connected from junction of resistors 123 & 124 to chassis	A13	Adjust for maximum deflection.
DIRECT	"	"	"	"	VTVM connected from Pin 8 of 6H6 to chassis	A14	Adjust for zero deflection. Swing signal generator 75KC above and 75KC below IF frequency and record readings. If these are not equal repeat Steps 3 & 4 and check again. It may be necessary to adjust A13 slightly to get these readings equal. This adjustment is very critical as misalignment will cause distortion of FM reception.
400Ω carbon resistor	High side to AM ant. terminal (with loop connected). Low side to chassis.	1500KC	BC	1500KC	Across voice coil	A15,A16 A17	Adjust for maximum output in order given.
"	"	600KC	"	600KC	"	A18,A19 A20	Adjust for maximum output in order given. Repeat Steps 5 & 6 until no further improvement can be made.
"	"	10MC	SW (left SW button)	10MC	"	A21,A22 A23.	Adjust for maximum output in order given.
"	"	12.4MC	SW (right SW button)	12.4MC	"	A24,A25 A26	"
39Ω (dipole disconnected)	See prealignment instructions.	49MC (unmodulated)	Low band FM (button on extreme right in row of 8 buttons)	49MC	VTVM connected from Pin 4 (grid) 6SJ7 1st limiter tube (5) to chassis	A27,A28 A29.	Adjust for maximum deflection in order given.
"	"	106MC	High band FM (3rd button from right end in row of 8 button)	106MC	"	A30,A31 A32.	"


FM AM
D D A G
6SG7
SECT. 3 R
SECT. 3 F
SECT. 4 R
SECT. 4 F
SECT. 5 R
SECT. 5 F
SECT. 6 R
SECT. 6 F
BANDSWITCH SEQUENCE;
SW. 2
SW 1
AM
FM 2
FM 1
PHONO
AVC
IF=455 AM
IF=10.7MC FM
BANDSWITCH SHOWN IN S.W. 2 POSITION
MAXIMUM COUNTER-CLOCKWISE POSITION
SECT. 1F
SECT. 1R
SW SW
RAD. PHONO
5R4
SPEAKER SOCKET
RECD. SOCK.
SPEAKER PLUG
TELEV.
PH.
4713-26



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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: STROMBERG-CARLSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	6SG7	6SG7	8BK	
2	Converter	6SB7Y	6SB7Y	8R	
3	1st IF Amp.	6SG7	6SG7	8BK	
4	2nd IF Amp.	6SH7	6SH7	8BK	
5	1st Limiter	6SJ7	6SJ7	8N	
6	2nd Limiter	6SJ7	6SJ7	8N	
7	Discriminator	6H6	6H6	7Q	
8	FM Tuning Ind. Amp.	6SQ7	6SQ7	8Q	
9	FM "	6SL7	6SL7	8BD	
10	AM Det.-AVC-FM Squelch	6SQ7	6SQ7	8Q	
11	Tuning Eye	6U5G	6U5G	6R	
12	1st AF Amp.	6SQ7	6SQ7	8Q	
13	Phase Inv.	6SN7	6SN7	8BD	
14	Power Output	6L6GT	6L6GT	7AC	
15	Power Output	6L6GT	6L6GT	7AC	
16	Rectifier	5R4G	5R4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: STROMBERG-CARLSON PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: SOLAR PART No.	REPLACEMENT DATA: SPRAGUE PART No.	REPLACEMENT DATA: AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
17	20	450	111006	KR520	RS219	D-20-450	PLS-20	GL450-20	Filter
18A	40	450	111007	UP4245	FP346	DY-3x20-450*	EL-425‡	AF444J	▲ Filter
B	20	200							■ "
19A	40	400	111005	UP9DJ55*		DY-406‡	EL-432‡	AF88J	▲ "
B	40	300						PRS250-20	■ "
C	20	250							▲ "
20A	40	150	111001	UP4415	FP214	DY-2x40-150	EL-25	AF88D	Hash Filter
B	40	150							" "
21	.003	400	46315	DT6D3	TP406	S-6-003	TC-23	484-003	Tone Compensation
22	.05	400	40632	DT4S5	TP425	S-4-05	TC-15	484-05	" "
23	.02	400	25150	DT4S2	TP423	S-4-02	TC-12	484-02	" "
24	.001	500	110408	DT6D1	TP404	S-6-001	TC-21	684-001	" "
25	.1	400	28325	DT4W1	TP428	S-4-1	TC-1	484-.1	" "
26	.05	400	40632	DT6D5	TP426	S-4-05	TC-15	484-05	
27	.01	600	25485	DT6S1	TP410	S-6-01	TC-11	684-01	Audio Coupling
28	.01	600	25485	DT6S1	TP410	S-6-01	TC-11	684-01	" "
29	.05	400	40632	DT4S5	TP426	S-4-05	TC-15	484-05	" "
30	.02	600	25484	DT6S2	TP412	S-6-02	TC-12	684-02	" "
31	.05	600	29891	DT6S5	TP415	S-6-05	TC-15	684-05	
32	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	AVC Filter
33	.1	200	28325	DT4W1	TP428	S-4-1	TC-1	484-.1	Grid Filter
34	.1	200	28325	DT4W1	TP428	S-4-1	TC-1	484-.1	" "
35	.003	600	46315	DT6D3	TP406	S-6-003	TC-23	684-003	Audio Coupling
36	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	RF Bypass Pwr. Supply
37	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	Disc. Fil. Bypass
38	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	2nd Lim. Plate Decoup.
39	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	2nd Lim. Screen Bypass
40	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	1st Lim. Screen Bypass
41	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	1st Lim. Grid Filter
42	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	AVC Filter
43	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	2nd IF Plate Decoup.
44	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	2nd IF Screen Bypass
45	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	1st IF Plate Decoup.
46	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	1st IF Screen Bypass
47	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	AVC Filter
48	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	Conv. Plate Decoup.
49	.005	600	110419	DT6D5	TP408	S-6-005	TC-25	684-005	Conv. Screen Bypass
50	.1	400	28325	DT4W1	TP428	S-4-1	TC-1	484-.1	RF Screen Bypass
51	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	RF Plate Decoup.
52	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	AVC Filter
53	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	AVC Filter
54	750	500	110215	1W5T8	MC251	MO.3-38			Tone Compensation
55	270	500	110208	5W5T3	MC240	MO.5-325			" "
56	470	500	110209	5W5T5	MC245	MO.5-347			" "
57	750	500	110215	1W5T8	MC251	MO.3-38		1468-00075	" "

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STROMBERG-CARLSON PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
109	22KΩ	½	27407	BTS-22K	Red-Red-Or. 1st Limiter Grid
110	1200Ω	½	28159	BTS-1200	Br.-Red-Red 1st Limiter Grid
111	100KΩ	½	28006	BTS-100K	Br.-Blk.-Yl. 1st Limiter Grid
112	1 Meg.	½	28191	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
113	100KΩ	½	28006	BTS-100K	Br.-Blk.-Yl. 1st Limiter Plate Load
114	15KΩ	½	28172	BTS-15K	Br.-Grn.-Or. 1st Limiter Screen Dropping
115	10KΩ	½	28170	BTS-10K	Br.-Blk.-Or. Decoupling
116	1.5 Meg.	½	28193	BTS-1.5 Meg.	Br.-Grn.-Grn. 2nd Limiter Grid Bias
117	47KΩ	½	28177	BTS-47K	Yl.-Vi.-Or. 2nd Limiter Grid Bias
118	10KΩ	½	28170	BTS-10K	Br.-Blk.-Or. 2nd Limiter Cathode
119	100KΩ	½	28006	BTS-100K	Br.-Blk.-Yl. 2nd Limiter Plate Decoupling
120	10KΩ	½	28170	BTS-10K	Br.-Blk.-Or. Voltage Dropping
121	390KΩ	½	28186	BTS-390K	Or.-White-Yl. Tuning Eye Plate Load
122	680KΩ	½	28189	BTS-680K	Blue-Gray-Yl. Tuning Eye Amp. Plate Load
123	220KΩ	½	28183	BTS-220K	Red-Red-Yl. Discriminator Load
124	220KΩ	½	28183	BTS-220K	Red-Red-Yl. " "
125	56KΩ	½	28178	BTS-56K	Grn.-Blue-Or. De-emphasis
126	150KΩ	1	27640	BTA-150K	Br.-Grn.-Yl. Tuning Eye Amp. Catnode Bias
127	100KΩ	½	28006	BTS-100K	Br.-Blk.-Yl. Tuning Eye Amp. Plate Load
128	33KΩ	½	28175	BTS-33K	Or.-Or.-Or. Tuning Eye Amp. Plate Bleeder
129	1 Meg.	½	28191	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
130	1 Meg.	½	28191	BTS-1 Meg.	Br.-Blk.-Grn. Tuning Eye Amp. Grid
131	1 Meg.	½	28191	BTS-1 Meg.	Br.-Blk.-Grn. Tuning Eye Amp. Grid
132	1800Ω	½	28161	BTS-1800	Br.-Gray-Red Tuning Eye Amp. Cathode
133	100KΩ	½	28006	BTS-100K	Br.-Blk.-Yl. Wire Recorder Shunt
134	1 Meg.	½	28191	BTS-1 Meg.	Br.-Blk.-Grn. Series Wire Recorder
135	2200Ω	½	28162	BTS-2200	Red-Red-Red Tone Compensation
136	10KΩ	½	28170	BTS-10K	Br.-Blk.-Or. Tone Compensation-See Note 1
137	2200Ω	½	28162	BTS-2200	Red-Red-Red 1st AF Cathode
138	100KΩ	½	28006	BTS-100K	Br.-Blk.-Yl. 1st AF Plate Load
139	100KΩ	½	28006	BTS-100K	Br.-Blk.-Yl. 1st AF Plate Decoupling
140	1500Ω	½	28160	BTS-1500	Br.-Grn.-Red Driver Cathode
141	1500Ω	½	28160	BTS-1500	Br.-Grn.-Red Driver Cathode
142	470KΩ	½	28187	BTS-470K	Yl.-Vi.-Yl. Driver Grid
143	56KΩ	½	28178	BTS-56K	Grn.-Blue-Or. Driver Plate Load
144	56KΩ	½	28178	BTS-56K	Grn.-Blue-Or. Phase Inverter Plate Load
145	470KΩ	½	28187	BTS-470K	Yl.-Vi.-Yl. Phase Inverter Grid
146	270KΩ	½	28184	BTS-270K	Red-Vi.-Yl. Output Grid
147	22KΩ	½	27407	BTS-22K	Red-Red-Or. Output Grid
148	270KΩ	½	28184	BTS-270K	Red-Vi.-Yl. Output Grid
149	125Ω	5	149208	ABA-150	Output Cathode-See Note 3
150	5000Ω	5	149207	AB-5000	Tone Compensation
151	56Ω	1	149164	BW-1-56	Grn.-Blue-Blk. Output Transformer Shunt
152	47KΩ	½	28177	BTS-47K	Yl.-Vi.-Or. Tone Compensation
153	150KΩ	½	27640	BTS-150K	Br.-Grn.-Yl. Tone Compensation
154	27KΩ	½	28174	BTS-27K	Red-Vi.-Or. Tone Compensation
155	150KΩ	½	27640	BTS-150K	Br.-Grn.-Yl. Tone Compensation
156	27KΩ	½	28147	BTS-27K	Red-Vi.-Or. Tone Compensation
157	220KΩ	½	28183	BTS-220K	Red-Red-Yl. Series Phono
158	220KΩ	½	28183	BTS-220K	Red-Red-Yl. Series Phono
159	68KΩ	½	28179	BTS-68K	Blue-Gray-Or. Tone Compensation
160	17KΩ	20	149009	DHA-20K	Voltage Divider -See Note 2
161	820Ω	½	28157	BTS-820	Gray-Red-Br. Voltage Divider
162	3900Ω	1	149182	BTA-3900	Or.-White-Red Voltage Divider
163	2700Ω	1	149180	BTA-2700	Red-Vi.-Red Voltage Divider
164	2200Ω	2	149078	BT-2-2200	Red-Red-Red Voltage Divider
165A	500Ω	6	149010	AB-500	" "
B	4000Ω	3.2		AB-4000	" "
166	1 Meg.	½	28191	BTS-1 Meg.	Br.-Blk.-Grn. Converter Grid

Note 1-Not used in all models.
Note 2-Set slider at 17KΩ from one end on IRC replacement.
Note 3-Set slider at 125Ω from one end on IRC replacement.

FILTER CHOKE

ITEM NO.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000v)	REPLACEMENT DATA: STROMBERG-CARLSON PART NO.	REPLACEMENT DATA: STANCOR PART NO.	REPLACEMENT DATA: THORDARSON PART NO.	INSTALLATION NOTES
167	.220A	58Ω	4.5 Henries	161002			

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA STROMBERG-CARLSON PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
58	50	500	34796	5W5Q5	MC225	MO.5-45	1FM-45	1468-00005	" "
59	100	500	34800	1W5D1	MCB235	MOS.5-31	MS-31	1469-0001	" "
60	100	500	34800	1W5D1	MCB235	MOS.5-31	MS-31	1469-0001	" "
61	2500	500	29559	1W5D5	MC460	MW.5-225		1467-0025	" "
62	390	500	110216	5W5T4	MC243	MO.5-34	1F4-34	1468-0004	De-emphasis
63	75	500	29359		MC230		1FM-475	1468-000075	Disc. Filter
64	470	500	110209	5W5T5	MC245	MO.5-35	1FM-35	1468-0005	2nd Limiter Cath. Bypass
65	47		110402	5W5Q5	MC225	MO.5-447	1FM-45	1468-00005	IF Coupling Cer.
66	100	500	34800	1W5D1	MC235	MO.5-31	1FM-31	1468-0001	Diode Filter
67	50	500	34796	5W5Q5	MC225	MO.5-45	1FM-45	1468-00005	" "
68	47		110402	5W5Q5	MC225	MO.5-447	1FM-45	1468-00005	IF Coupling Cer.
69	47		110402	5W5Q5	MC225	MO.5-447	1FM-45	1468-00005	IF Coupling Cer.
70	47		110402	5W5Q5	MC225	MO.5-447	1FM-45	1468-00005	IF Coupling Cer.
71	1000		110408						Conv. Fil. Bypass Cer.
72	1000		110408						Conv. Screen Bypass Cer.
73	100		110401	1W5D1	MC235	MO.5-31	1FM-31	1468-0001	Osc. Grid Cap. Cer.
74	10		110411	5W5Q1	MC215	MO.5-41	1FM-41	1468-00001	Fixed Trimmer Cer.
75	375	500	110203						" Pad
76	50		34796	5W5Q5	MC225	MO.5-45	1FM-45	1468-00005	Fixed Padder Cer.
77	5		110413	5W5V5	MC205	MO.5-55	MS-55	1468-000005	Fixed Trimmer Cer.
78	2.5		110412						" " "
79	1000		110408						RF Screen Bypass Cer.
80	100		110401	1W5D1	MC235	MO.5-31	1FM-31	1468-0001	RF Coupling Cer.
81	100		110401	1W5D1	MC235	MO.5-31	1FM-31	1468-0001	" " "
82	10	500	110202	5W5Q1	MC215	MO.5-41	1FM-41	1468-00001	Fixed Trimmer
83	100	500	34800	2R5D1	MCB235	MOS.5-31	MS-31	1469-0001	Ant. Coupling
84	2								Conv. Cath. Bypass Cer.†
85	750	500	110215	1W5T8	MC251	MO.3-38		1468-00075	Phase Inv. Grid Filter
210	100		110401	1W5D1	MC235	MO.5-31	1FM-31	1468-0001	RF Coupling Cer.
211	.01	600	24585	DT6S1	TP410	S-6-01	TC-11	684-01	RF Bypass Pwr. Supply

*Parallel two sections to obtain desired capacity
†Not used in all models.
#Omit one section.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA STROMBERG-CARLSON PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
86A	1 Meg.	1	145002	MRT440	D13-137X	T-109	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 89A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA STROMBERG-CARLSON PART No.	IRC PART No.	IDENTIFICATION CODES
87	1 Meg.	½	149007	BTS-1 Meg.	Br.-Blk.-Grn. RF Grid
88	1 Meg.	½	149007	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network-See Note 1
89	22KΩ	½	149005	BTS-22KΩ	Red-Red-Or. RF Plate Load
90	1000Ω	½	28158	BTS-1000	Br.-Blk.-Red RF Plate Decoupling
91	68KΩ	½	28179	BTS-68K	Blue-Gray-Or. RF Screen Dropping
92	4700Ω	½	149004	BTS-4700	Yl.-Vi.-Red RF Coil Shunt
93	100KΩ	½	28006	BTS-100K	Br.-Blk.-Yl. AVC Network
94	1000Ω	½	28158	BTS-1000	Br.-Blk.-Red Cathode-See Note 1
95	33KΩ	½	28175	BTS-33K	Or.-Or.-Or. Converter Grid
96	1000Ω	½	28158	BTS-1000	Br.-Blk.-Red Converter Plate Decoupling
97	1 Meg.	½	28191	BTS-1 Meg.	Br.-Blk.-Grn. 1st IF Grid
98	39KΩ	½	28176	BTS-39K	Or.-White-Or. 1st IF Screen Dropping
99	1000Ω	½	28158	BTS-1000	Br.-Blk.-Red 1st IF Plate Decoupling
100	1 Meg.	½	28191	BTS-1 Meg.	Br.-Blk.-Grn. 2nd IF Grid
101	33KΩ	½	28175	BTS-33K	Or.-Or.-Or. 2nd IF Screen Dropping
102	56KΩ	½	28178	BTS-56K	Grn.-Blue-Or. 2nd IF Screen Bleeder
103	1000Ω	½	28158	BTS-1000	Br.-Blk.-Red 2nd IF Plate Decoupling
104	1 Meg.	½	28191	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
105	100K	½	28006	BTS-100K	Br.-Blk.-Yl. AVC Network
106	150KΩ	½	27040	BTS-150K	Br.-Grn.-Yl. Diode Load
107	100KΩ	½	28006	BTS-100K	Br.-Blk.-Yl. " "
108	10KΩ	½	28170	BTS-10K	Br.-Blk.-Or. Diode RF Filter

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA STROMBERG-CARLSON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA THORDARSON PART No.	
168	117V AC @ 1.6A	700V CT @ .220A	5.0V AC @ 2.0A	6.4V AC @ 6.2A	161403			
			SEC. 4	SEC. 5				
			6.5V AC @ .3A	50V AC @ 1.0A				

TRANSFORMER (OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA STROMBERG-CARLSON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA THORDAR'N PART No.		INSTALLATION NOTES
169	4600Ω CT	9.4Ω	175Ω CT	.6Ω	161206	A-3851‡	T22S70‡		‡Drill new mounting holes.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA STROMBERG-CARLSON PART No.	REPLACEMENT DATA JENSEN PART No.		INSTALLATION NOTES
	FIELD RES.	VC IMP.				
170	220Ω	9.4Ω	155019			
	CONE DIA.	VC DIA.				
171	10"	1-5/8"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA STROMBERG-CARLSON PART No.	REPLACEMENT DATA MEISSNER PART No.	
172	BC Loop Ant.	0Ω				
173	FM Dipole					
174A	BC Ant. Coil	0Ω	4.3Ω	114005		Items 174A, 174B wound on same coil form
B	SW 1 Ant. Coil	0Ω	.5Ω	114005		
175A	FM Ant. Coil Pri.	0Ω				Items 175A, 175B, 175C wound on same coil form.
B	FM 2 Ant. Coil Sec.		0Ω			
175C	FM 1 Ant. Coil Sec.		0Ω			
176A	BC RF Coil		3.9Ω	114003		Items 176A, 176B wound on same coil form.
B	SW 1 RF Coil		.4Ω	114003		
177	FM 2 " "		0Ω			
178	FM 1 " "		0Ω			
179A	BC Osc. Coil		5.2Ω	114004		Items 179A, 179B wound on same coil form.
B	SW 1 " "		.4Ω	114004		
180	FM 2 " "		0Ω			
181	FM 1 " "		0Ω			
182	FM 2 Ant. Coil		1.5Ω			Items 182, 183, 184 may be obtained as complete assembly under Part No. 114020.
183	SW 2 RF Coil		1.5Ω			
184	SW 2 Osc. Coil		1.5Ω			
185A	1st IF AM	6Ω	6.5Ω	161202		Items 185A, 185B are in same can.
B	1st IF FM	.5Ω	.5Ω	161202		
186A	2nd IF AM	6Ω	6Ω	161200		
B	" " FM	.5Ω	.5Ω	161200		Items 186A, 186B are in same can.
187A	3rd IF AM	6Ω	6Ω	161201		
B	" " FM	.5Ω	.5Ω	161201		Items 187A, 187B are in same can.
188	Disc. IF	.5Ω	.2Ω			
				114017		

MADE C/47 SSR 25 FOLDER 4

PARTS LIST AND DESCRIPTIONS (Continued)

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA STROMBERG-CARLSON PART No.		INSTALLATION NOTES
189 to 197 Inc.	Bayonet	6-8	0.25	Blue	29956		Type 44

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA STROMBERG PART No.	ASTATIC PART No.	REMARKS
198	50891	QTM	Original Astatic Type MLP-2

MISCELLANEOUS

ITEM No.	PART NAME	STROMBERG-CARLSON PART No.	NOTES
199	Tone Switch	158005	Bass
200	" "	158006	Treble
201	Switch	158019	S.W. Radio, Phono
202	"		Pushbutton "
203	Squelch Switch	158014	
204	Fuse	25156	3AG 3 Amp.
205	Tuning Capacitor		
206	Motor	140001	Switch Drive
207	RF Chassis Assy.	112008	Complete RF Assby.
208	Labyrinth	29597	
209	Bass Boost	167009	Network
A32	Trimmer Cap.	110007	FM Ant. H.F.
	RF Trimmer H.F.	110006	A27, A28, A29, A30, A31
	Knob	32156	PB
	"	32172	Lens, PB
	"	32224	On-Off, Volume
	"	37007	Indicator Lever, Tone
	Phono Jack	31539	
	Iron Core	118001	IF
	" "	118002	RF
	Dial Scale	122009	
	Lens	138002	Phono
	"	138005	Range
	Dial Pointer	144003	

PUSHBUTTON ADJUSTMENTS

1. Determine number of stations to be set up on each of the FM bands and the broadcast band. The total number can not exceed eight.
2. Remove pushbutton terminal setup cover at rear of chassis.(CAUTION-Do not remove this cover with power on.) Connect a jumper from AM terminal to as many numbered terminals as pushbuttons to be set up on broadcast band. The numbers on terminal strip correspond to the pushbuttons on front panel.
3. Connect a jumper from "FM1" terminal to as many numbered terminals as pushbutton to be set up on FM1 Band.
4. Connect a jumper from "FM2" terminal to as many numbered terminals as pushbuttons to be set up on FM2 Band. IF there is no station which can be received on either or both of the FM bands all buttons may be setup on the band or bands where stations can be received. However it is recommended that at least one button be set up on each FM band as this is the only means of getting bandswitch to these bands.
5. Replace terminal cover and turn on receiver and allow to warm up for at least 15 minutes.
6. Remove (by pulling out) pushbuttons from the upper row of eight pushbutton shafts.
7. Loosen set screws on each button shaft about one turn.
8. Push in any broadcast button shaft. Carefully tune in desired station and slowly release button and tighten set screw firmly. Set up the remaining buttons by following same procedure as above.
9. When setting up a button on either of the FM bands it is necessary to depress the corresponding FM button to switch the receiver to the correct band. Procedure is then the same as outlined in Step 8 above.

STAGE GAIN MEASUREMENTS

MEASUREMENT	GAIN	FREQ.
Ant. to RF Grid	1.5X	1000KC
RF Grid to Conv. Grid	10X	1000KC
Converter Gain	4.5X	IN 1000KC OUT 455KC
Conv. Grid to 2nd IF Grid	24X	455KC
2nd IF Grid to Det. Diode	40X	455KC
1st Audio Grid to Output	745X	400 ∿

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting to chassis.

SQUELCH SWITCH ON.

*TAKEN IN HIGH FM BAND.

TREBLE AND BASS SWITCHS AT MAXIMUM.

VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SG7	0V.	6.4VAC	0V.	-.5VDC	0V.	85VDC	0V.	105VDC
2	6SB7Y	0V.	6.4VAC	250VDC	95VDC	-10VDC§	0V.	0V.	0V.
3	6SG7	0V.	6.4VAC	0V.	-.5VDC	0V.	110VDC	0V.	245VDC
4	6SH7	0V.	6.4VAC	0V.	-.2VDC	0V.	105VDC	0V.	250VDC
* 5	6SJ7	0V.	6.4VAC	0V.	-.35VDC	0V.	33VDC	0V.	39VDC
* 6	6SJ7	0V.	6.4VAC	43VDC	15VDC	43VDC	88VDC	0V.	245VDC
* 7	6H6	0V.	6.4VAC	-.3VDC	0V.	-.3VDC	0V.	0V.	0V.
* 8	6SQ7	0V.	-.5VDC	0V.	0V.	0V.	67VDC	0V.	6.4VAC
* 9	6SL7	-.35VDC	50VDC	0V.	0V.	67VDC	3VDC	0V.	6.4VAC
* 10	6SQ7	0V.	-.5VDC	0V.	-.55VDC	-.55VDC	15VDC	0V.	6.4VAC
12	6SQ7	0V.	0V.	1.2VDC	0V.	0V.	140VDC	11VDC†	11VDC†
13	6SN7	0V.	107VDC	4.0VDC	0V.	105VDC	4.0VDC	0V.	6.4VAC
14	6L6G	0V.	6.4VAC	285VDC	290VDC	0V.	0V.	0V.	19VDC
15	6L6G	0V.	6.4VAC	285VDC	290VDC	0V.	285VDC	0V.	19VDC
16	5R4G	0V.	370VDC	0V.	350VAC	340VDC	350VAC	0V.	370VDC

†MEASURE 6.5VAC BETWEEN FILAMENT PINS.

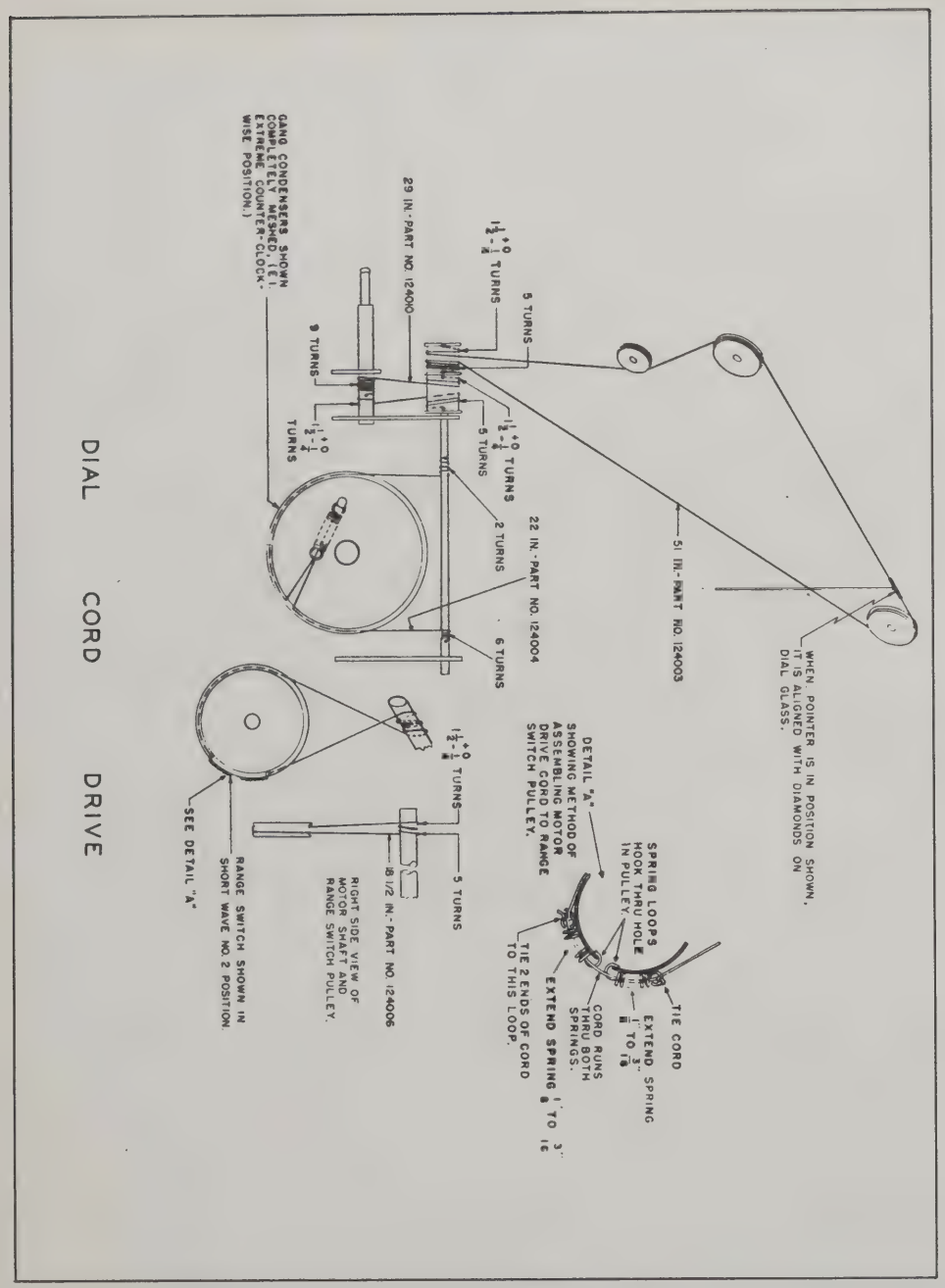
§TAKEN WITH VACUUM TUBE VOLTMETER.

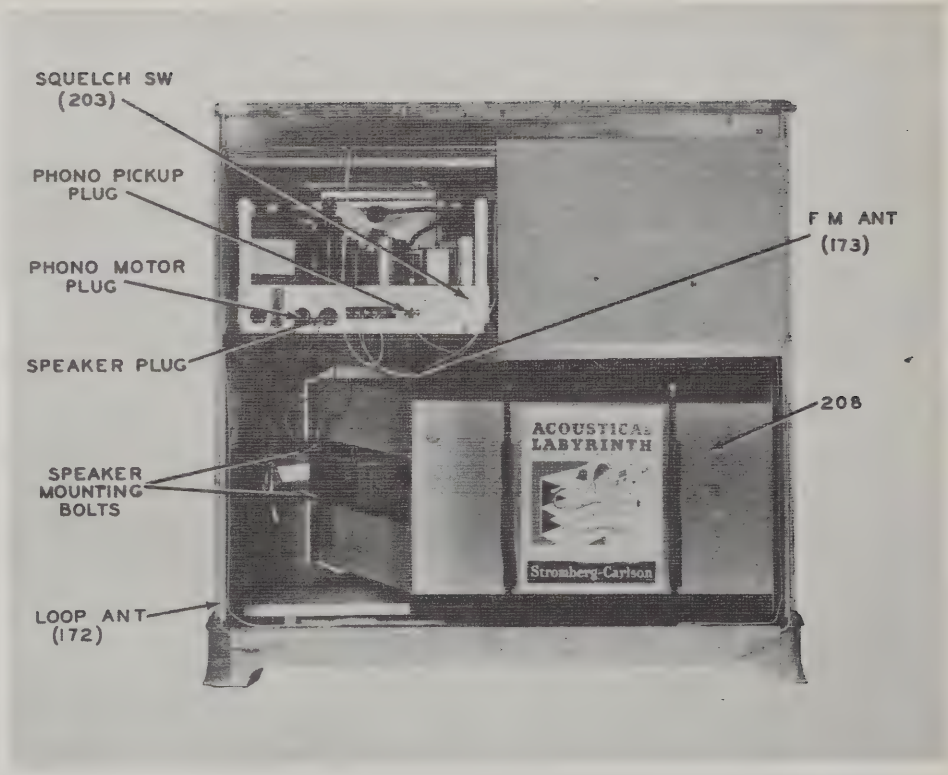
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SG7	0Ω	.1Ω	0Ω	2.5 Meg.	0Ω	70KΩ	0Ω	28KΩ
2	6SB7Y	0Ω	.1Ω	6KΩ	4KΩ	30KΩ	.3Ω	0Ω	2.4 Meg.
3	6SG7	0Ω	.1Ω	0Ω	2.4 Meg.	0Ω	34KΩ	0Ω	6KΩ
4	6SH7	0Ω	.1Ω	0Ω	1 Meg.	0Ω	23KΩ	0Ω	6KΩ
* 5	6SJ7	0Ω	.1Ω	0Ω	23KΩ	0Ω	20KΩ	0Ω	100KΩ
* 6	6SJ7	0Ω	.1Ω	7KΩ	1.5 Meg.	7KΩ	8KΩ	0Ω	100KΩ
* 7	6H6	0Ω	.1Ω	180KΩ	0Ω	180KΩ	320KΩ	0Ω	320KΩ
* 8	6SQ7	0Ω	110KΩ	0Ω	0Ω	0Ω	700KΩ	0Ω	.1Ω
* 9	6SL7	1.3 Meg.	23KΩ	0Ω	1.3 Meg.	700KΩ	1800Ω	0Ω	.1Ω
* 10	6SQ7	0Ω	110KΩ	0Ω	260KΩ	260KΩ	1.4 Meg.	0Ω	.1Ω
12	6SQ7	0Ω	750KΩ	1800Ω	0Ω	0Ω	200KΩ	800Ω	800Ω
13	6SN7	450KΩ	560KΩ	720Ω	470KΩ	600KΩ	720Ω	0Ω	.1Ω
14	6L6G	0Ω	.1Ω	6KΩ	6KΩ	260KΩ	INF.	0Ω	120Ω
15	6L6G	0Ω	.1Ω	6KΩ	6KΩ	280KΩ	11KΩ	0Ω	120Ω
16	5R4G	INF.	6KΩ	INF.	21Ω	6KΩ	20Ω	INF.	6KΩ

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS


DIAL CORD DRIVE
GANG CONDENSERS SHOWN COMPLETELY MESHED. (I.E. EXTREME COUNTER-CLOCK-WISE POSITION.)
29 IN. - PART NO. 124004
22 IN. - PART NO. 124004
51 IN. - PART NO. 124003
WHEN POINTER IS IN POSITION SHOWN, IT IS ALIGNED WITH DIAMONDS ON DIAL GLASS.
5 TURNS
9 TURNS
2 TURNS
6 TURNS
SEE DETAIL "A"
RANGE SWITCH SHOWN IN SHORT WAVE NO. 2 POSITION.
RIGHT SIDE VIEW OF MOTOR SHAFT AND RANGE SWITCH PULLEY.
45 1/2 IN. - PART NO. 124006
DETAIL "A" SHOWING METHOD OF ASSEMBLING MOTOR DRIVE CORD TO RANGE SWITCH PULLEY.
SPRING LOOPS HOOK THRU HOLE IN PULLEY
TIE CORD
EXTEND SPRING 1" TO 3"
CORD RUNS THRU BOTH SPRINGS.
EXTEND SPRING 1" TO 3"
TIE 2 ENDS OF CORD TO THIS LOOP.



DISASSEMBLY INSTRUCTIONS

1. Remove two pushon type control knobs.
2. Remove speaker plug from chassis.
3. Remove phono-motor plug from chassis.
4. Remove phono pick-up plug from chassis.
5. Remove FM dipole from terminal strip on chassis.
6. Remove loop antenna leads from terminal strip on chassis.
7. Remove four bolts holding mounting board for acoustical labyrinth and speaker in cabinet. Remove mounting board from cabinet.
8. Remove four wood screws from the wooden blocks that hold the chassis mounting board in cabinet.
9. Slide chassis and chassis mounting board out rear of cabinet.
10. Remove four bolts holding chassis mounting board to chassis. Remove chassis from mounting board.

TELE-TONE
MODEL 138

TELE-TONE
MODEL 138

TELETONE MODEL 138

TRADE NAME	Teletone, Model 138 (Chassis Series "N")
MANUFACTURER	Teletone Radio Co., 609 W. 51st St., New York, N.Y.
TYPE SET	AC-DC 2 Band Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types, 12SA7 Converter, 12SK7 IF Amp., 12SQ7 Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.

POWER SUPPLY 105-125 Volts AC-DC RATING .260 Amps. @ 117V AC
TUNING RANGE—BROADCAST 530-1700KC SHORT WAVE 5-18MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial. Use isolation transformer if available. If not, connect a .1 MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to front stator of tuning cap. Low side to B-.	455KC	BC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output If isolation transformer is not used reduce dummy ant. to .001 MFD. to reduce hum modulation.
2	200MMFD	High side to ext. ant. lead. Low side to chassis.	1700KC	"	"	"	A5	Adjust for maximum output
3	200MMFD	"	1600KC	"	Tune for maximum output.	"	A6	" " " "
4	200MMFD	"	600KC	"	"	"	A7	Rock tuning cap. and adjust for maximum output. Repeat Steps 2, 3 and 4 until no further improvement can be made.
5	400Ω	"	18MC	SW	Tuning cap. fully open.	"	A8	Adjust for maximum output
6	400Ω	"	15MC	"	Tune for maximum output.	"	A9	Rock tuning cap. and adjust for maximum output.

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DATE 9/47 SET 23 FOLDER 4713-27

PARTS LIST AND DESCRIPTIONS

TELE-TONE MODEL 13F

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TELETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7	12SA7	8R	
2	IF Amp.	12SK7	12SK7	8N	
3	Det.-AVC-AF	12SQ7	12SQ7	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TELETONE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	20	150	CE-11	EZ42215	TN129	DSB-3x20-150	TA-303	PRSA150-20-20	Filter - Blue
B	20	150							" - Green
C	20	150						PRS150-20	" - Red
7	.02	400	CP-203-3	DT4S2	TP423	S-4-02	TC-12	484-02	Line Filter
8	.02	400	CP-203-3	DT4S2	TP423	S-4-02	TC-12	484-02	Output Plate Bypass
9	.01	400	CP-103-1	DT4S1	TP421	S-4-01	TC-11	484-01	Audio Coupling
10	.005	400	CP-502-1	DT6D5	TP408	S-6-005	TC-25	484-005	" "
11	.05	400	CP-503-1	DT4S5	TP426	S-4-05	TC-15	484-05	RF Bypass Pwr. Supp.
12	.1	200	CP-104-3	DT4P1	TP428	S-4-1	TC-1	484-.1	Line Isolation
13	.05	400	CP-503-1	DT4S5	TP423	S-4-05	TC-15	484-05	AVC Filter
14	220	500	CM-221-1	5W5T25	MC240	M0.5-322	1FM-325	1468-00025	Diode Filter
15	68	500	CM-680-1						Osc. Grid Capacitor
16	3300		CM-332-1						Fixed Padder

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TELETONE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
17A	500KΩ	1	A-VC-1	MR48*	D13-133*	M-60-Z*	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 17A per instructions
C	Switch		"	M26	41	SW-A	" " " "

*Install a 47KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft side, terminals down.)

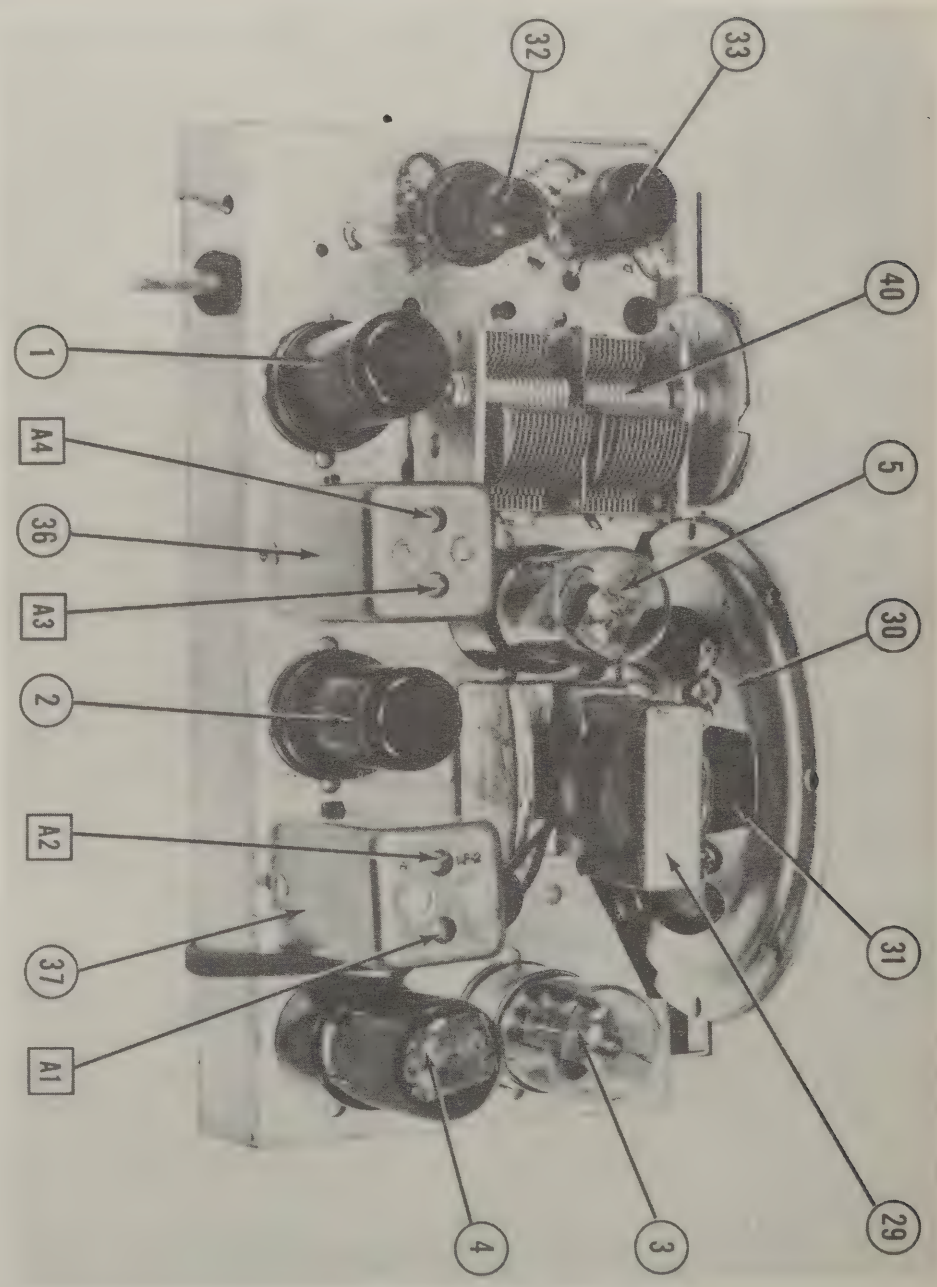
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TELETONE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
18	220KΩ	½	RC-224-1	BTS-220K	Red-Red-Yl. Line Isolation
19	47Ω	½	RC-470-2	BW-½-47	Yl.-Vi.-Blk. Parasitic Suppressor
20	22KΩ	½	RC-223-1	BTS-22K	Red-Red-Or. Oscillator Grid
21	2.2 Meg.	½	RC-225-1	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
22	10 Meg.	½	RC-106-1	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
23	220KΩ	½	RC-224-1	BTS-220K	Red-Red-Yl. AF Plate Load
24	470KΩ	½	RC-474-1	BTS-470K	Yl.-Vi.-Yl. Output Grid
25	150Ω	½	RC-151-1	BW-½-150	Br.-Grn.-Br. Output Cathode
26	1500Ω	½	RC-152-1	BTS-1500	Br.-Grn.-Red Filter
27	150Ω	1	RC-151-5	BW-1-150	Br.-Grn.-Br. Filter
28	18Ω	½	RC-180-1	BW-½-18	Br.-Gray-Blk. Surge Limiter

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: TELETONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDARSON PART No.		INSTALLATION NOTES
29	2500Ω	3.4Ω	180Ω	.5Ω	TR1	A-3876‡	T-2S45‡		‡Bend mounting tabs down, file out slots and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: TELETONE PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA:	INSTALLATION NOTES
	FIELD	VC IMP.		ST-105†		†Drill and tap magnet frame.
30A B	PM	3.4Ω	ASP1 SP50	Mod. P5-X		Alternate Speaker
	CONE DIA.	VC DIA.				
31	4-3/4"	1/2"	CONE HAS SPECIAL ADJUSTMENT FEATURE-ORDER FROM MANUFACTURER.			

R F COILS

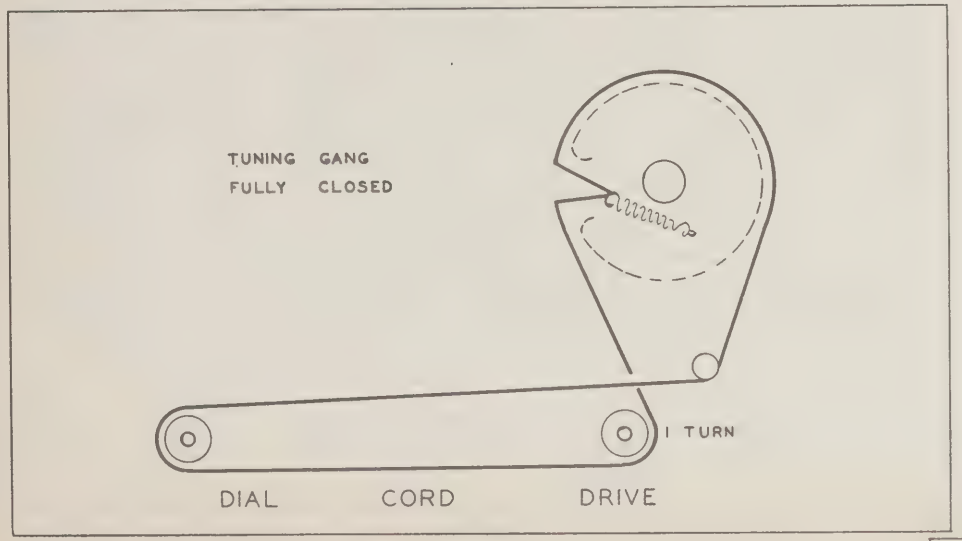
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: TELETONE PART No.	REPLACEMENT DATA: MEISSNER PART No.
32	BC Ant.Coil	48Ω	5Ω	LA-1	14-1026
33	SW Ant.Coil	.3Ω	0Ω	LA-2	14-1044
34	BC Osc.Coil	.5Ω	6Ω	LC-3	14-1040
35	SW Osc.Coil	.3Ω	0Ω	LC-2	
36	Input IF	20Ω	20Ω	LF-14	16-6658
37	Output IF	20Ω	20Ω	LF-14	16-6660

DIAL LIGHT

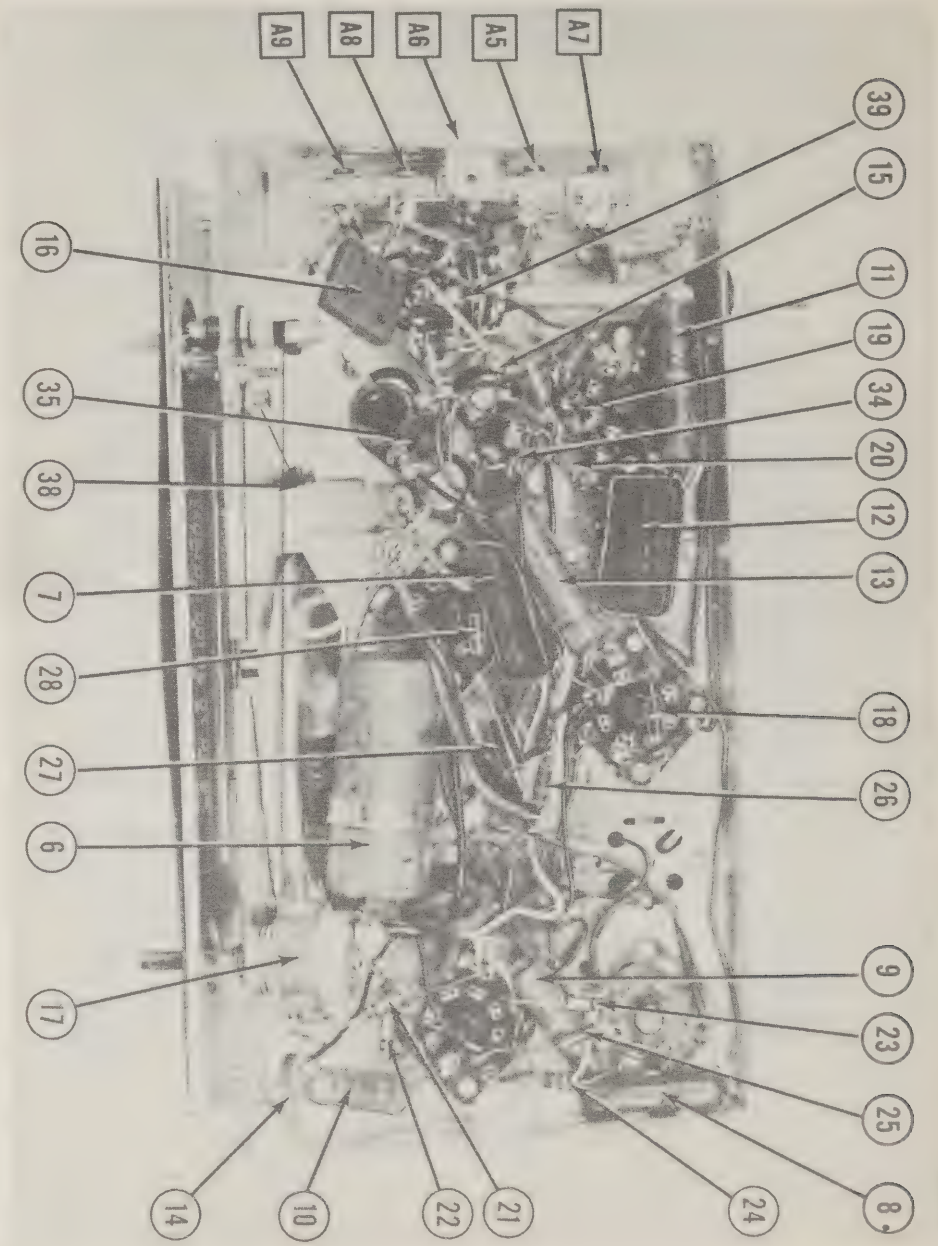
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: TELETONE PART No.	REPLACEMENT DATA:	INSTALLATION NOTES
38	Bayonet	6-8	0.15	Brown	BU-47		Type 47

MISCELLANEOUS

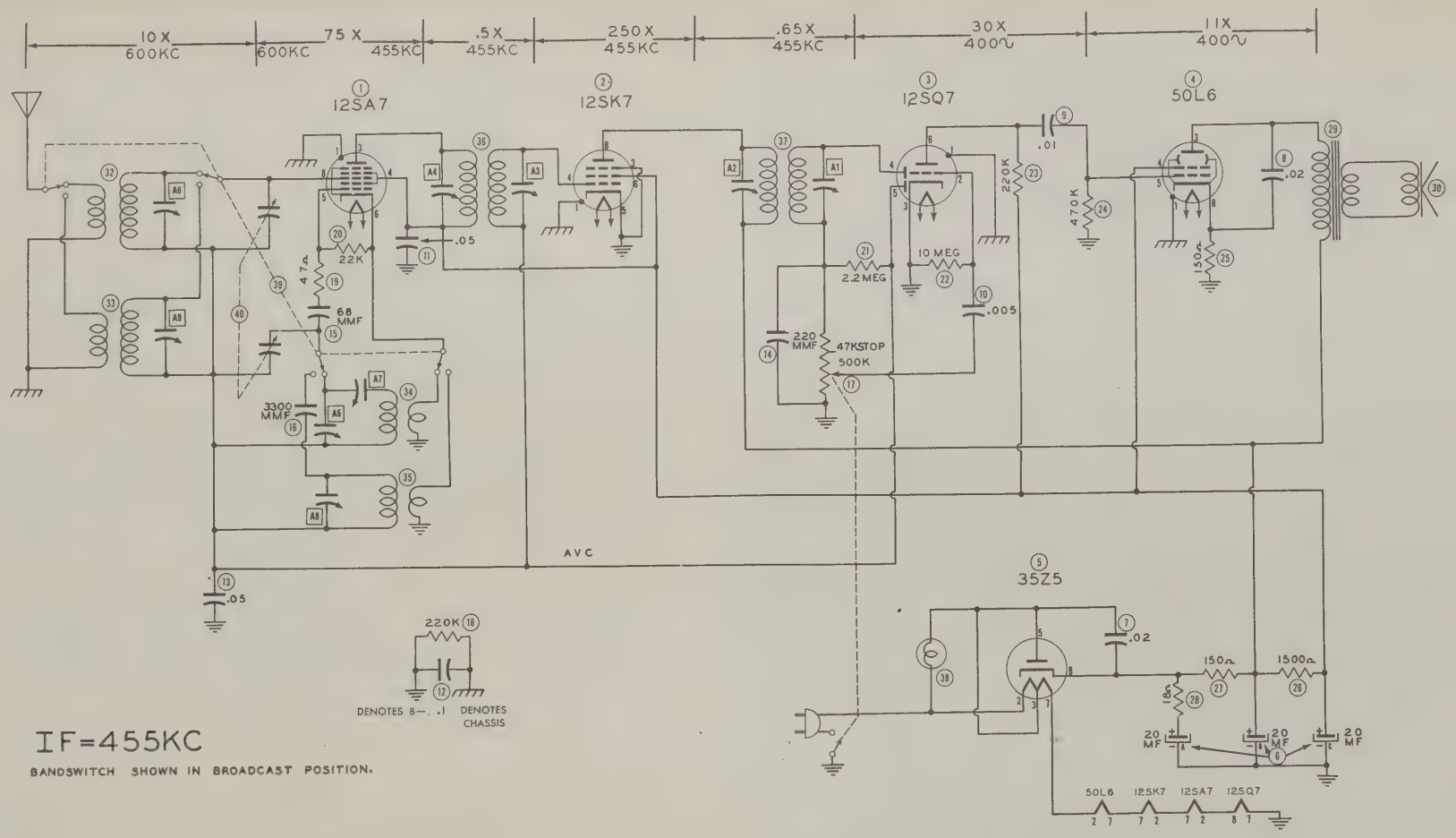
ITEM No.	PART NAME	TELETONE PART No.	NOTES
39	Band Switch	SW-2	
40	Tuning Capacitor	CV-12	(16-454 MMF, 16-454 MMF)



CHASSIS—BOTTOM VIEW



TELE-TONE MODEL 128



IF=455KC

BANDSWITCH SHOWN IN BROADCAST POSITION.

VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	0V.	26VAC	89VDC	89VDC	-4.3VDC§	0V.	38VAC	-.8VDC
2	12SK7	0V.	13VAC	0V.	-.8VDC	0V.	89VDC	26VAC	109VDC
3	12SQ7	0V.	-.9VDC	0V.	-.6VDC	-.8VDC	63VDC	0V.	13VAC
4	50L6GT	0V.	85VAC	103VDC	89VDC	0V.	0V.	38VAC	5.2VDC
5	35Z5GT	0V.	117VAC	112VAC	0V.	112VAC	118VDC	85VAC	118VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	200KΩ	25Ω	100KΩ	100KΩ	22KΩ	.4Ω	37Ω	2.8 Meg.
2	12SK7	200KΩ	12Ω	0Ω	2.8 Meg.	0Ω	100KΩ	25Ω	100KΩ
3	12SQ7	200KΩ	10 Meg.	0Ω	460KΩ	2.8 Meg.	360KΩ	0Ω	12Ω
4	50L6GT	INF.	78Ω	100KΩ	100KΩ	460KΩ	INF.	37Ω	130Ω
5	35Z5GT	INF.	108Ω	105Ω	INF.	105Ω	100KΩ	78Ω	100KΩ

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

4713-27

A PHOTOFACT STANDARD NOTATION SCHEMATIC.
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The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

TELE-TONE
MODEL 145 (BATTERY OPERATED)

TELE-TONE
MODEL 145 (BATTERY OPERATED)

TELE-TONE MODEL 145

TRADE NAME Tele-Tone, Model 145 (Chassis Series "R")
MANUFACTURER Teletone Radio Co., 609 W. 51st St., New York, N.Y.
TYPE SET Three Power Portable Superheterodyne Receiver with Loop Antenna
TUBES (FOUR) Types, 1R5 Converter, 1U4 IF Amp., 1S5 Det.-AVC-AF, 3S4 Power Output.

POWER SUPPLY RATING 105-125 Volts AC-DC or 7½ Volt "A" Supply and 67½ Volt "B" Supply
.150 Amps. @ 117V AC or 55MA @ 7½ Volt DC and 9MA @ 67½ V DC
TUNING RANGE—BROADCAST 530KC to 1700KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer turn turing cap. fully closed and set left edge of pointer 1½" from left edge of dial backplate. Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1 MFD capacitor in series with the low side of the signal generator and B -. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning capacitor. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy ant. to 200 MMF to reduce hum modulation.
2	.1 MFD.	"	1700KC	"	"	A5	Adjust for maximum output.
3		Loop	1500KC	Tune for maximum output.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		TELE-TONE PART No.	STANDARD REPLACEMENT		
1	Converter	1R5	1R5	7AT	
2	IF Amp.	1U4	1U4	6AR	
3	Det.-AVC-AF	1S5	1S5	6AU	
4	Power Output	3S4	3S4	7BA	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	TELE-TONE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	
5A	25	150	CE-12				EL-351		Filter - Red
B	25	150							" - Green
C	125	10							Filament Bypass-Yel.
6	.05	400	CP-503-1	DT4S5	TP426	S-4-05	TC-15	484-05	Line Filter
7	.01	150	CP-103-2	ZY1S1	MT125	TTF-15-01			Bias Filter
8	.005	400	CP-502-2	DT6D5	TP408	S-6-005	TC-25	484-005	Output Plate Bypass
9	.002	120	CP-202-1	ZY2D2	MT107	TTF-15-002			Audio Coupling
10	.01	150	CP-103-2	ZY1S1	MT125	TTF-15-01			Audio Screen Bypass
11	.001	120	CP-102-1	ZY2D1	MT105	TTF-15-001			Audio Coupling
12	.05	150	CP-503-2	ZY1S5	MT135	TTF-15-05			Filament Bypass
13	.01	150	CP-103-2	ZY1S1	MT125	TTF-15-01			IF Grid Filter
14	.01	150	CP-103-2	ZY1S1	MT125	TTF-15-01			Conv. Decoupling
15	.05	150	CP-503-2	ZY1S5	MT135	TTF-15-05			Fil. Bypass
16	.05	150	CP-503-2	ZY1S5	MT135	TTF-15-05			AVC Filter
17	.1	200	CP-104-2	DT4P1	TP428	S-4-1	TC-1	484-.1	Line Isolation
18	100	500	CM-101-1	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Audio Plate Bypass
19	100	500	CM-101-1	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Diode Filter

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	TELE-TONE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
20	1 Meg.	1	VC-6				Volume Control & Switch

RESISTORS

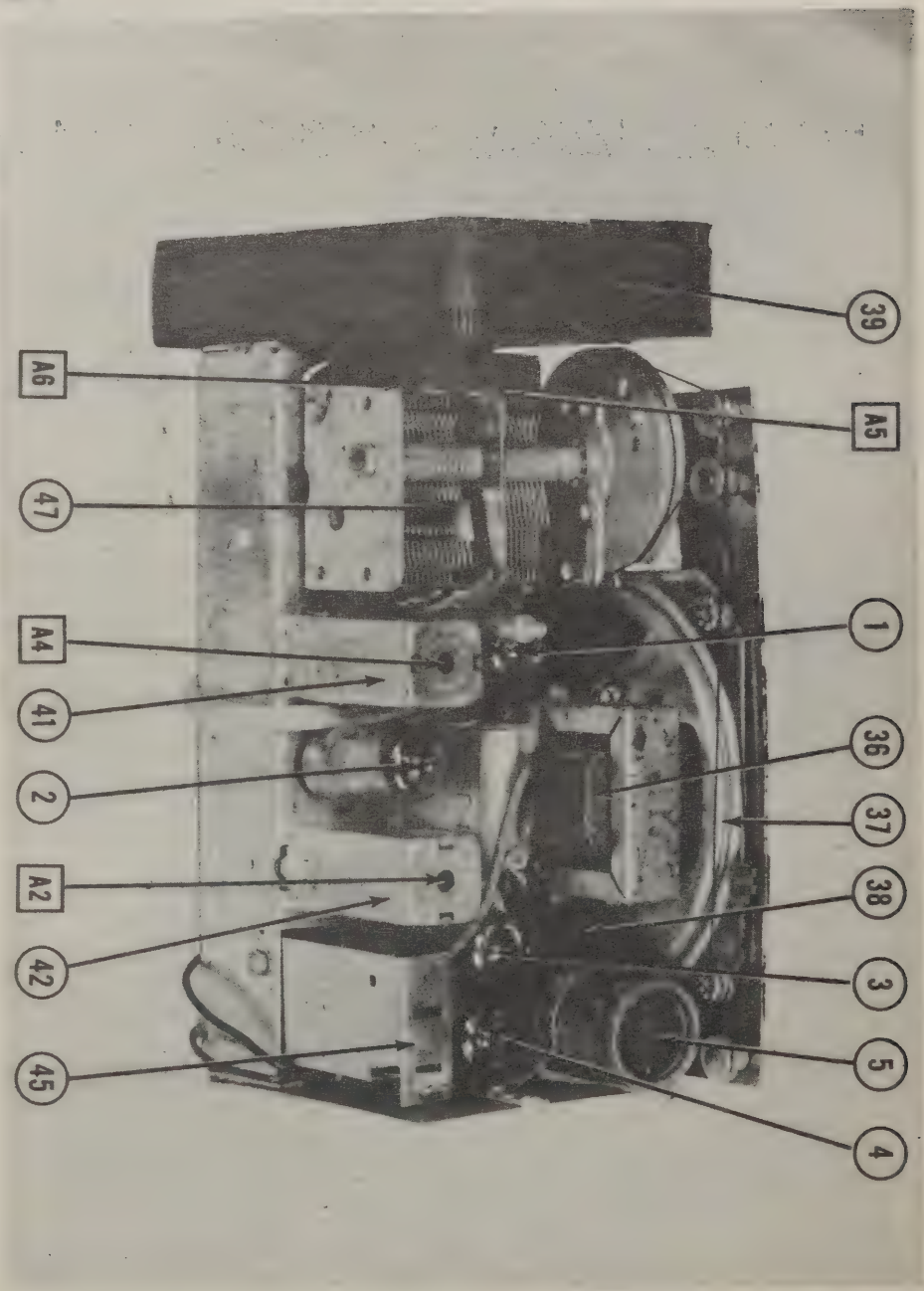
ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	TELE-TONE PART No.	IRC PART No.	
21	100KΩ	½	RC104-2	BTS-100K	Br.-Blk.-Yl. Oscillator Grid
22	3.3 Meg.	½	RC335-1	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
23	15KΩ	½	RC153-1	BTS-15K	Br.-Grn.-Or. Converter Screen
24	10 Meg.	½	RC106-1	BTS-10 Meg.	Br.-Blk.-Blue IF Grid
25	10 Meg.	½	RC106-1	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
26	3.3 Meg.	½	RC335-1	BTS-3.3 Meg.	Or.-Or.-Grn. AF Screen Dropping
27	1 Meg.	½	RC105-1	BTS-1 Meg.	Br.-Blk.-Grn. AF Plate Load
28	2.2 Meg.	½	RC225-1	BTS-2.2 Meg.	Red-Red-Grn. Output Grid
29	470Ω	½	RC471-1	BTS-470	Yl.-Vi.-Br. Filament String
30	820Ω	½	RC821-2	BTS-820	Gray-Red-Br. Filament String
31	1 Meg.	½	RC105-2	BTS-1 Meg.	Br.-Blk.-Grn. Bias
32	270KΩ	½	RC274-2	BTS-270K	Red-Vi.-Yl. Bias
33	2720Ω	10	RP-1		Filament String
34	6800Ω	1		BTA-6800	Blue-Gray-Red Filter - See Note 1
35	33Ω	1		BW-1-33	Or.-Or.-Blk. Surge Limiter-See Note 2

Note 1 - Some models use 7500Ω in this application. IRC replacement BTA-6800.
Note 2 - Some models use 56Ω in this application. IRC replacement BW-1-56.

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		TELE-TONE PART No.	STANCOR PART No.	THORDARSON PART No.		
	PRI.	SEC.	PRI.	SEC.					
36	6000Ω	3.3Ω	440Ω	.65Ω	TR-7	A-3878*	T22S46*		*Bend mounting tabs down, file out slots and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA TELE-TONE PART No.	JENSEN PART No.		INSTALLATION NOTES
37A B	FIELD PM	VC IMP. 3.3Ω	R-SP4 SP-41	ST-1131† Mod. P4-X		†Drill and tap magnet frame. Trim flange to clear control. Alternate Speaker
38	CONE DIA. 4"	VC DIA. 1/2"	NOT READILY	REPLACEABLE-USE COMPLETE SPEAKER UNIT		

R F COILS

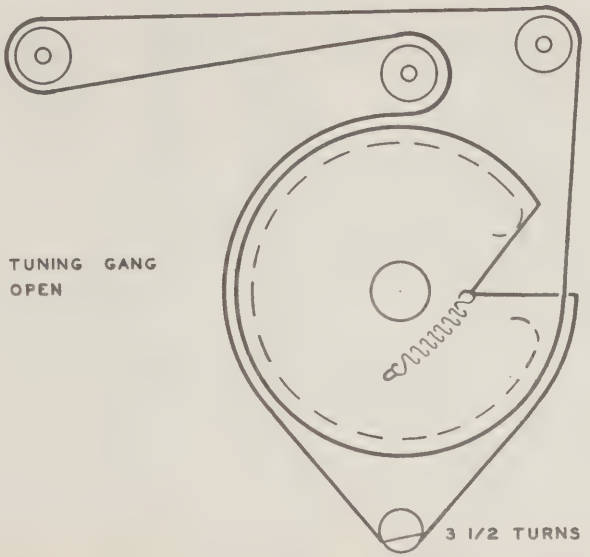
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA TELE-TONE PART No.	MEISSNER PART No.	
39	Loop Ant.		.3Ω	LP-6		
40	Osc. Coil	2.5Ω	6.5Ω	LC-4	14-1040	Add 50 MMFD from grid to high side tuning cap.
41	Input IF	19Ω	19Ω	LF-19	16-6668	
42	Output IF	19Ω	19Ω	LF-19	16-6669	

BATTERIES

ITEM No.	VOLTAGE	TELE-TONE PART No.	EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	INSTALLATION NOTES
43	1½ V "A"		#950			5 Used in Series
44	67½V "B"			#467		

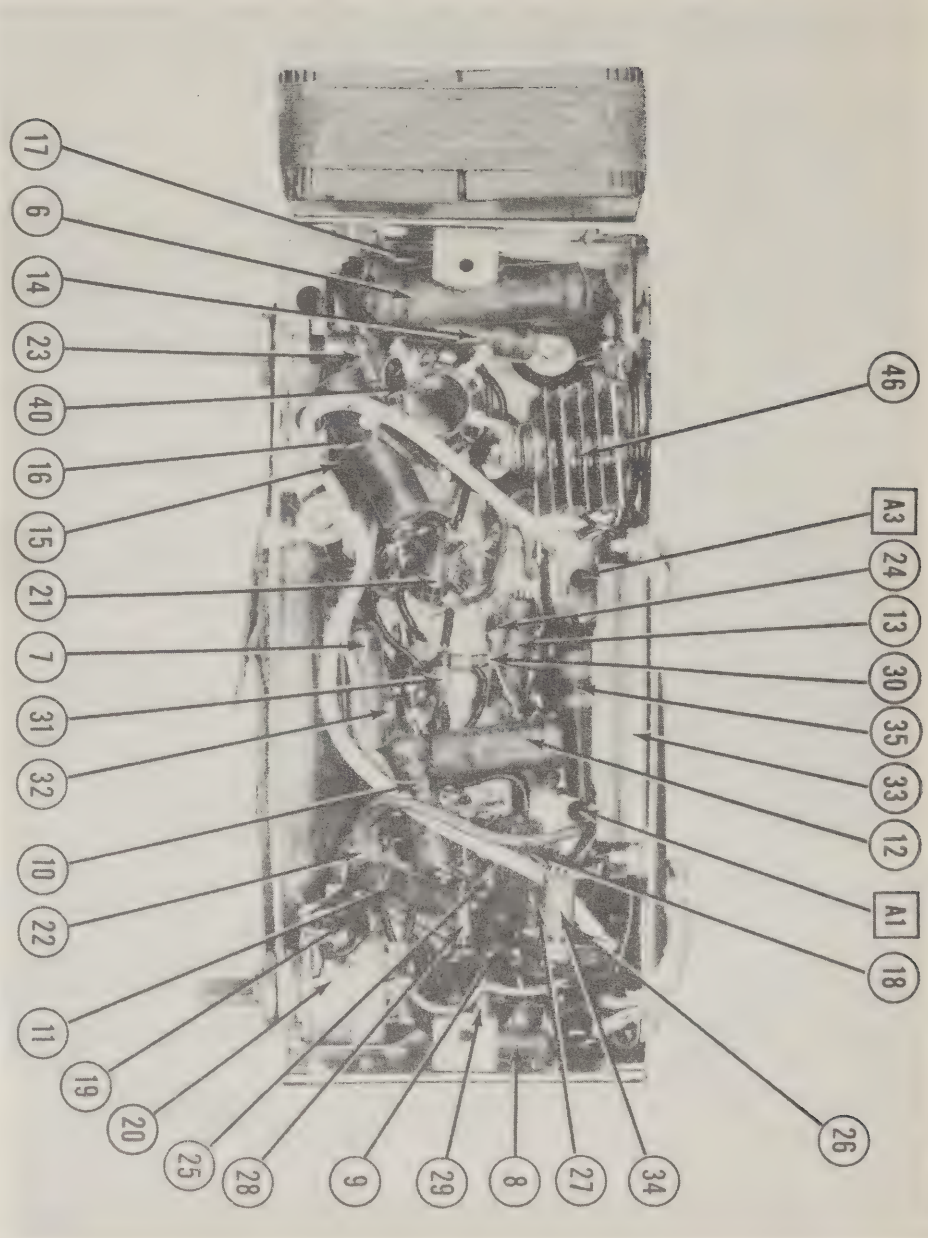
MISCELLANEOUS

ITEM No.	PART NAME	TELE-TONE PART No.	NOTES
45	Switch	SW-3	Power Change
46	Rectifier	SR-1	Selenium
47	Tuning Capacitor	CV-10	(27-475 MMF, 18-184 MMF)

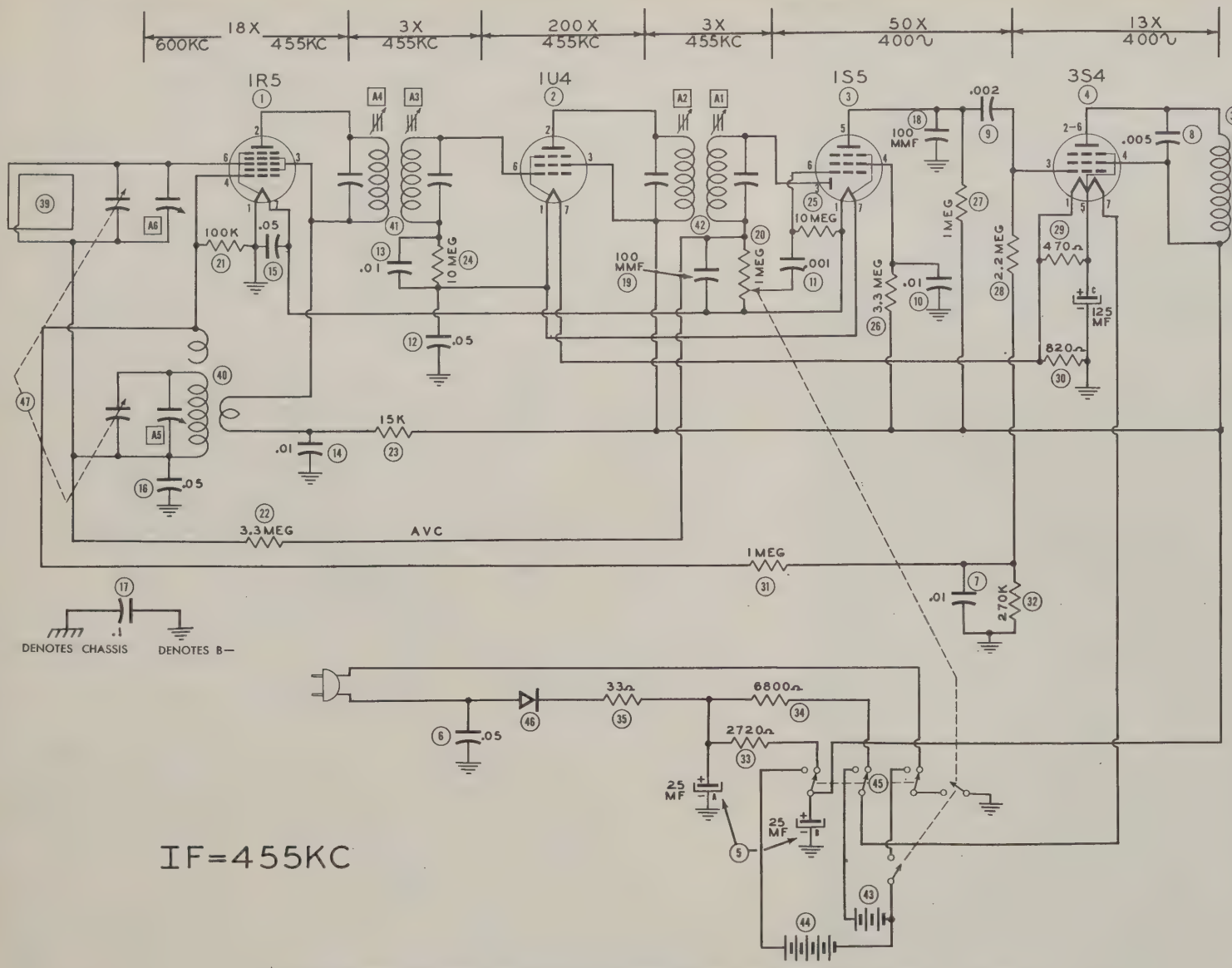


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



DATE 9/47 SET 23 FOLDER 4713-23
TELE-TONE MODEL 145
TELE-TONE MODEL 145



VOLTAGE AND RESISTANCE READINGS TAKEN IN AC-DC POSITION.

Pin	1R5		1U4	
No.	Volt.	Res.	Volt.	Res.
1	0V.	*	2.9VDC	*
2	40VDC	24KΩ	75VDC	9KΩ
3	40VDC	24KΩ	75VDC	9KΩ
4	-5VDC§	85KΩ	0V.	INF
5	0V.	*	2.9VDC	*
6	0V.	4 Meg.	0V.	10 Meg.
7	1.5VDC	*	4.4VDC	*

Pin	1S5		3S4	
No.	Volt.	Res.	Volt.	Res.
1	1.5VDC	*	4.4VDC	*
2	0V.	INF	75VDC	9.5KΩ
3	.1VDC	900KΩ	-1VDC	2.5 Meg.
4	16VDC	3 Meg.	75VDC	9KΩ
5	10VDC	1 Meg.	5.8VDC	*
6	0V.	10 Meg.	75VDC	9.5KΩ
7	2.9VDC	*	7VDC	*

§TAKEN WITH VACUUM TUBE VOLTMETER.

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

4713-28

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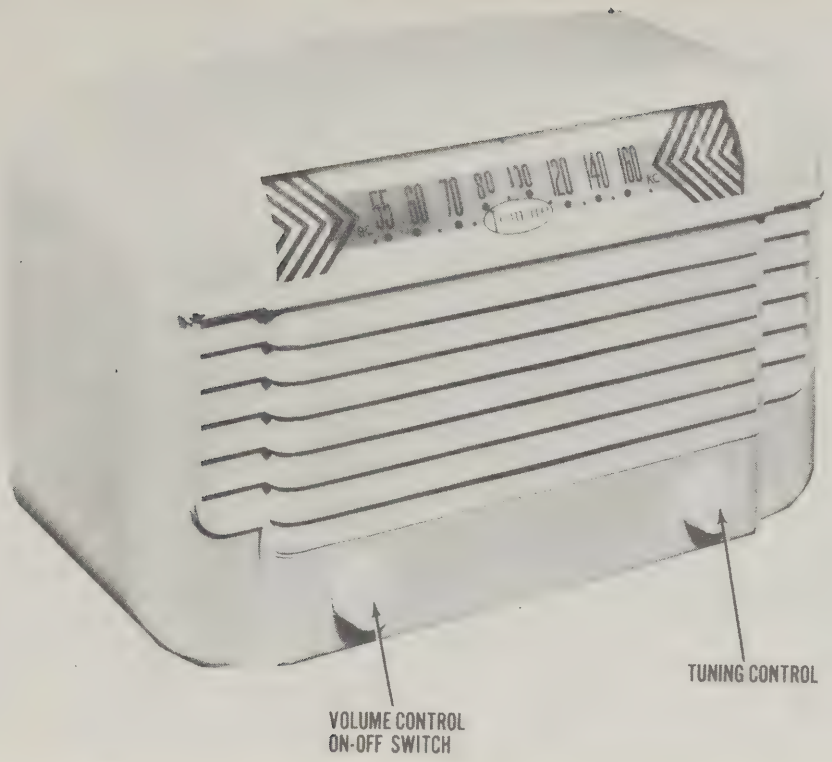
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is shorted to low side of volume control.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.



TEMPLE
MODEL G-513

TEMPLE
MODEL G-513

TEMPLE MODEL G-513

TRADE NAME	Temple, Model G-513
MANUFACTURER	Templetone Radio Mfg. Corp., New London, Conn.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types, 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	110-120 Volts AC-DC
TUNING RANGE—BROADCAST	540-1620KC RATING .260 Amps. @ 117V AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial. Use isolation transformer if available. If not, connect a .1 MFD capacitor in series with low side of signal generator and chassis. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01MFD.	High side to rear stator of tuning cap. Low side to chassis.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used, reduce dummy ant. to .001 MFD. to reduce hum modulation.
2		Loop	1700KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1550KC	Tune for maximum output.	"	A6	Adjust for maximum output.

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DATE 9/47 SET 23 FOLDER 4713-29

PARTS LIST AND DESCRIPTIONS

TEMPLE MODEL G-516

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TEMPLE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7GT	12SA7GT	8AD	
2	IF Amp.	12SK7GT	12SK7GT	8N	
3	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TEMPLE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	50	150		EZ5515	2N521	DSB-2x50-150	TA505		Filter - Red
B	50	150							" - Green
7	.1	400		DT4F1	TP428	S-4-1	TC-1	484-.1	Line Bypass
8	.02	400		DT4S2	TP423	S-4-02	TC-12	484-02	Output Plate Bypass
9	.005	600		DT6D5	TP408	S-6-005	TC-25	684-005	Audio Coupling
10	.005	600		DT6D5	TP408	S-6-005	TC-25	684-005	" "
11	.1	600		DT6P1	TP418	S-6-1	TC-1	684-.1	AVC Filter
12	.01	600		DT6S1	TP410	S-6-01	TC-11	684-01	RF Bypass Pwr. Supp.
13	.02	600		DT6S2	TP412	S-6-02	TC-12	684-02	Ant. Coupling
14	220	500		5W5T2	MC237	M0.5-32	1FM-32	1468-0002	AF Plate Bypass
15	100	500		5W5T1	MC235	M0.5-31	1FM-31	1468-0001	Osc. Grid Cap.

‡Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TEMPLE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
16A	500KΩ	1		MK401	D13-133	M-60-Z	Volume Control
B	Shaft			Not Req.	E	Not Req.	Attach to 16A per instructions
C	Switch			M-26	41	SW-A	" " " " "

RESISTORS

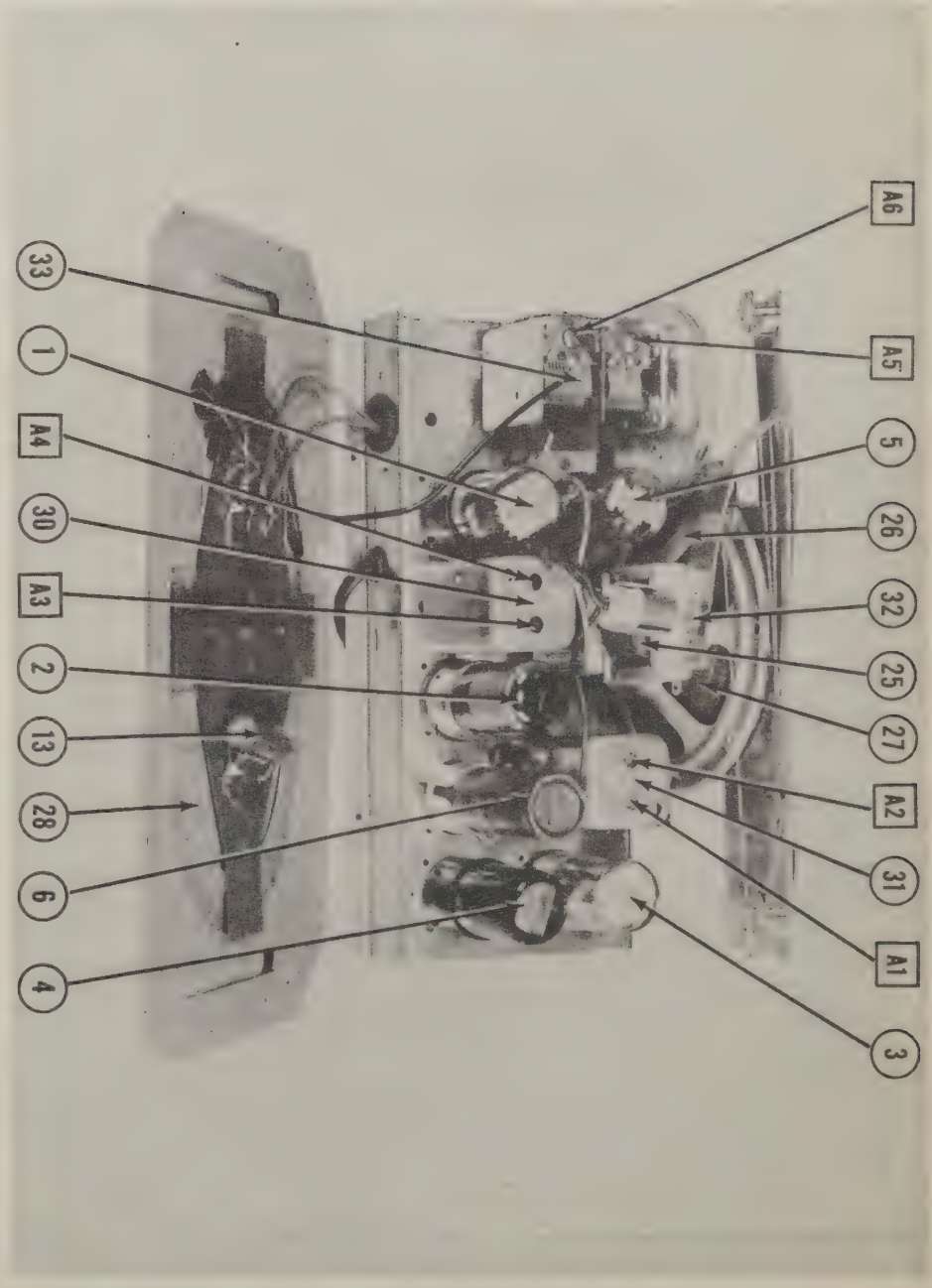
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WOOLAROC PART No.	IRC PART No.	IDENTIFICATION CODES
17	22KΩ	½		BTS-22K	Red-Red-Or. Oscillator Grid
18	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. AVC Network
19	3.9 Meg.	½		BTS-3.9 Meg.	Or.-White-Grn. AF Grid
20	220KΩ	½		BTS-220K	Red-Red-Yl. AF Plate Load
21	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
22	120Ω	½		BW-½-120	Br.-Red-Br. Output Cathode
23	1000Ω	1		BTA-1000	Br.-Blk.-Red Filter
24	100Ω	1		BW-1-100	Br.-Blk.-Br. Surge Limiter-See Note 1

Note 1 - Not used in all models.

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: TEMPLE PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
25	1950Ω	3.2Ω	115Ω	.6Ω		A-3876*	T22S45*		*Bend mounting tabs down, file out slots and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			TEMPLE PART No.	JENSEN PART No.		
	FIELD	VC IMP.		ST-105		
26	PM	3.2Ω		Mod. P5-X		
	CONE DIA.	VC DIA.				
27	4-3/4"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

R F COILS

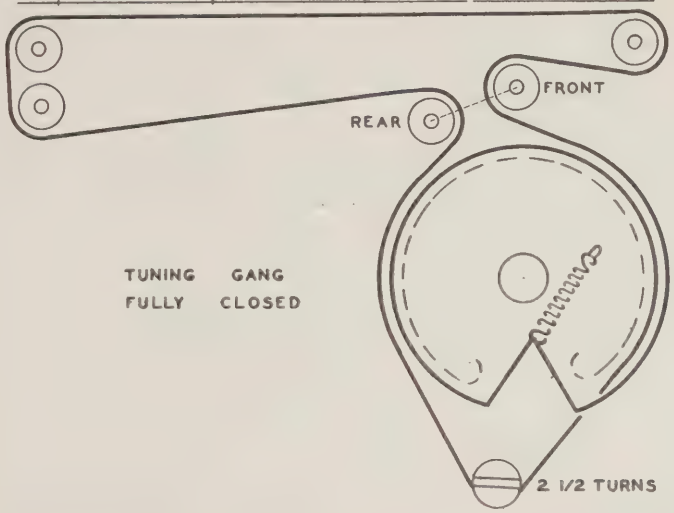
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	TEMPLE PART No.	MEISSNER PART No.	
28	Loop Ant.	.2Ω	1.3Ω	LL14		
29	Osc. Coil		6.8Ω	LO-2	14-1040	
30	Input IF	15.5Ω	15.5Ω	TM2-1	16-6658	
31	Output IF	16Ω		TM2-3	16-6670	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					TEMPLE PART No.		
32	Bayonet	6-8	0.15	Brown			Type 47

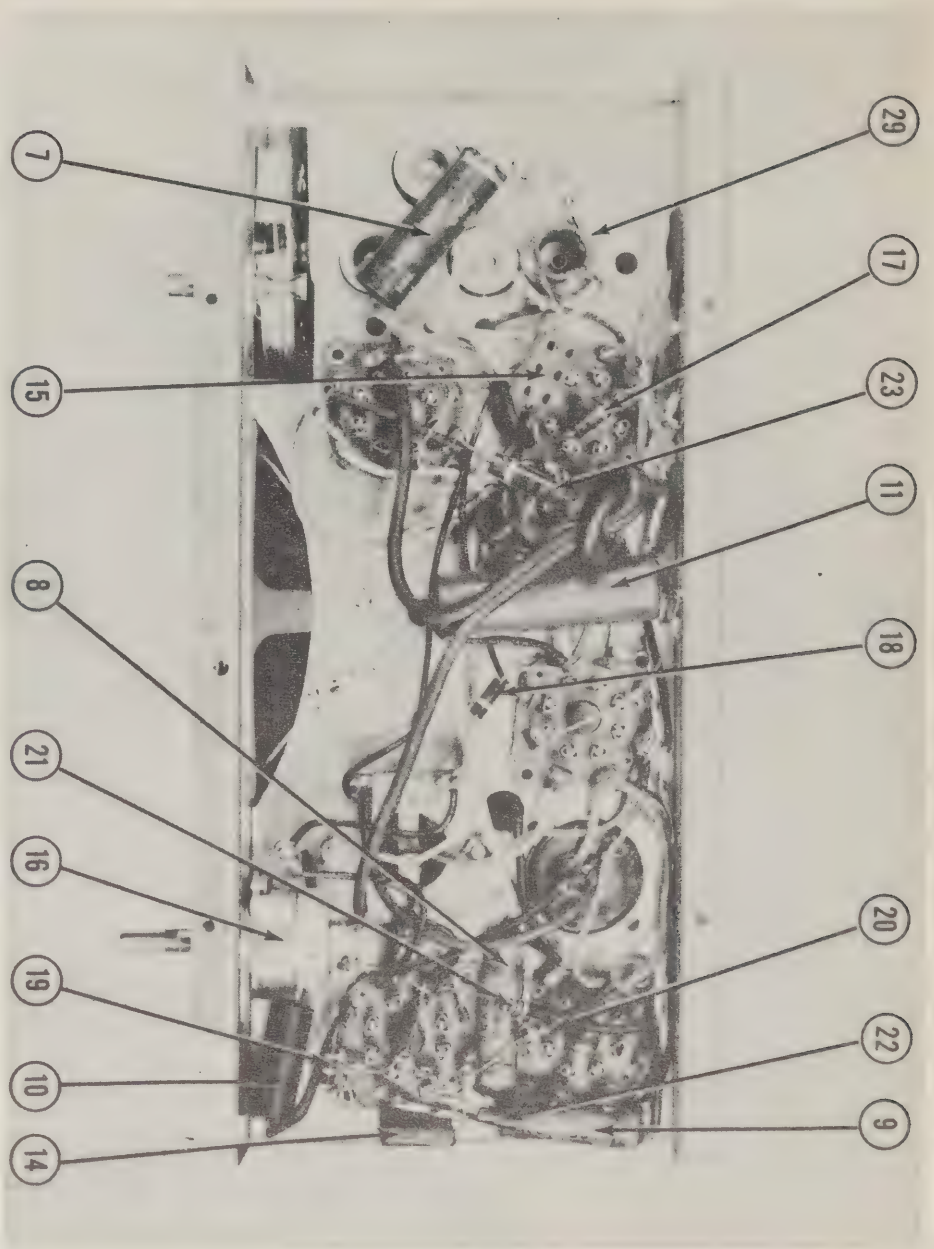
MISCELLANEOUS

ITEM No.	PART NAME	TEMPLE PART No.	NOTES
33	Tuning Cap.	CV-6	(23-440 MMF, 20-186 MMF)



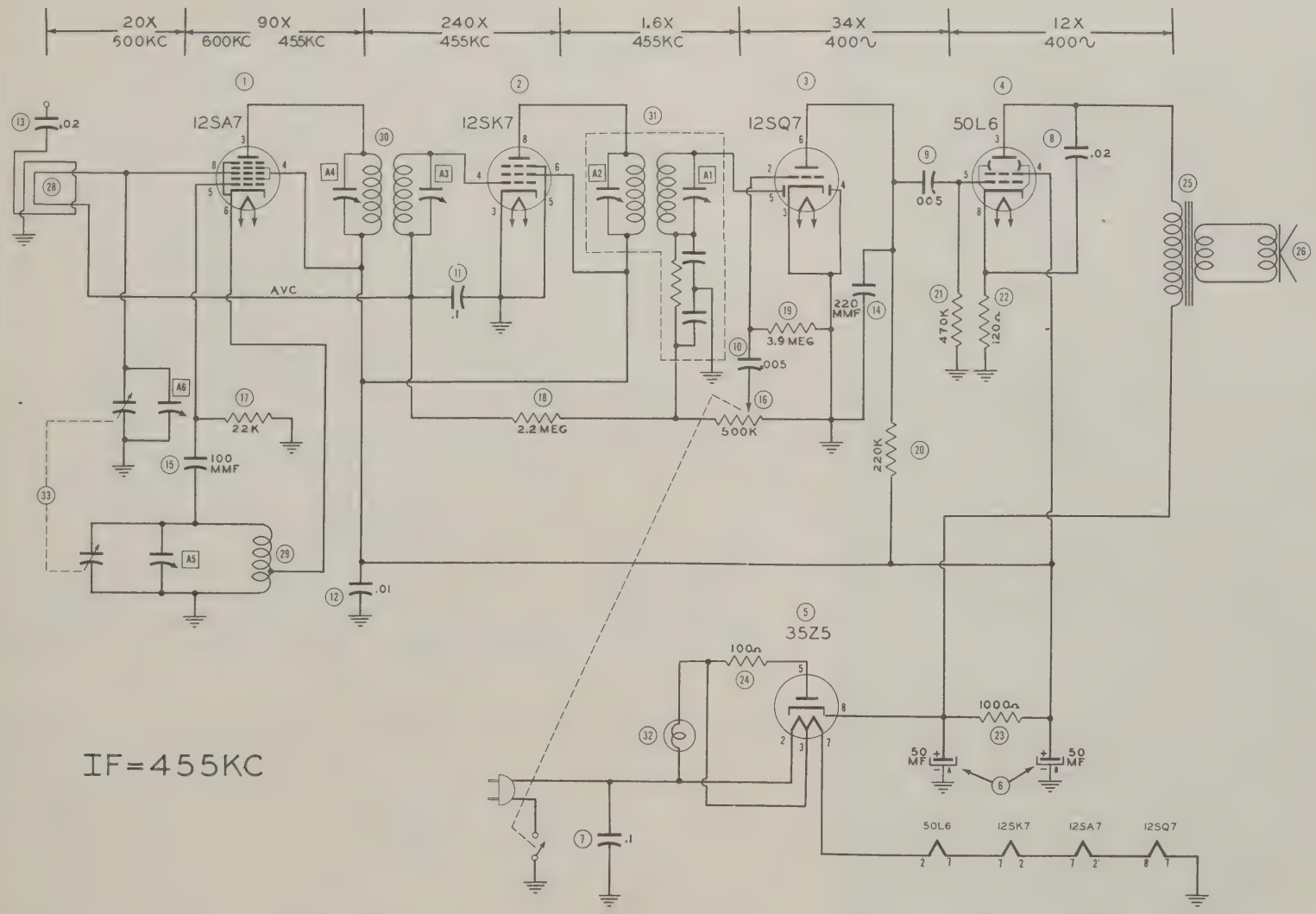
DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



TEMPLE MODEL G-513

TEMPLE MODEL G-513



Pin No.	[illegible]		12SK7GT	
	Volt.	Res.	Volt.	Res.
1	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]
3	88VDC	110KΩ	[illegible]	[illegible]
4	[illegible]	110KΩ	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]
6	[illegible]	[illegible]	88VDC	110KΩ
7	[illegible]	[illegible]	37VAC	38Ω
8	[illegible]	[illegible]	88VDC	110KΩ

Pin No.	[illegible]		50L6GT	
	Volt.	Res.	Volt.	Res.
1	[illegible]	[illegible]	0V.	INF
2	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	108VDC	110KΩ
4	[illegible]	[illegible]	88VDC	110KΩ
5	[illegible]	[illegible]	[illegible]	[illegible]
6	[illegible]	330KΩ	0V	INF
7	0V.	0Ω	[illegible]	[illegible]
8	12VAC	1Ω	[illegible]	[illegible]

Pin No.	[illegible]	
	Volt.	Res.
1	117VAC	111Ω
2	117VAC	111Ω
3	112VAC	109Ω
4	112VDC	110KΩ
5	112VAC	[illegible]
6	[illegible]	[illegible]
7	[illegible]	[illegible]
8	112VDC	110KΩ

$TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

4713-29

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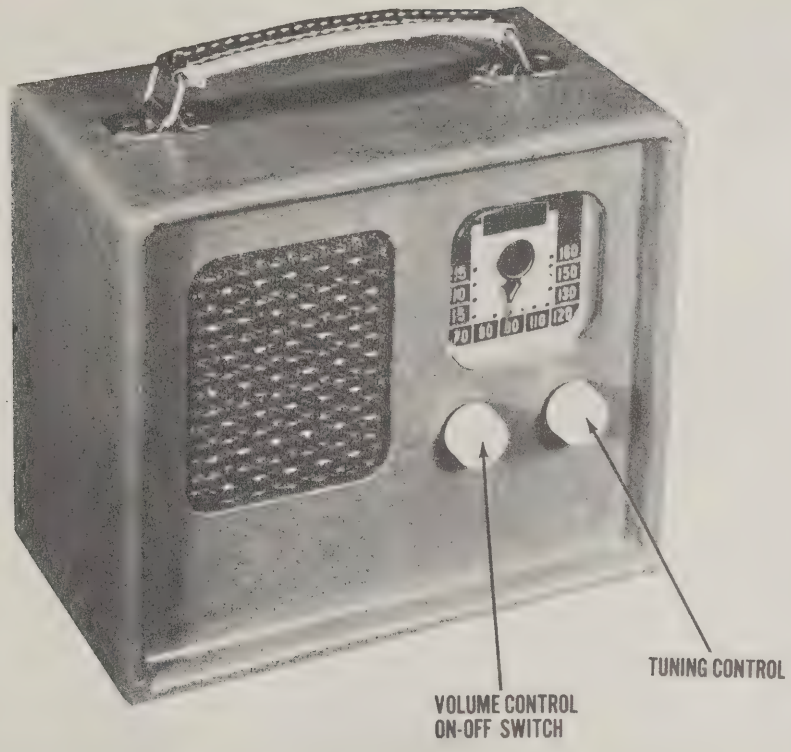
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

TRAV-LER
MODEL 5019 (BATTERY OPERATED)



TRAV-LER
MODEL 5019 (BATTERY OPERATED)

TRAV-LER MODEL 5019

TRADE NAME	Trav-ler, Model 5019
MANUFACTURER	Trav-ler Karenola Radio & Tel. Corp., 571 W. Jackson Blvd., Chicago, Ill.
TYPE SET	Battery Operated Superheterodyne Personal Portable Receiver
TUBES (FOUR)	Types, 1R5 Converter, 1U4 IF Amp., 1S5 Det.-AVC-AF, 3S4 Power Output
POWER SUPPLY RATING	1½ Volt "A" Supply and 67½ Volt "B" Supply 250MA @ 1½ V DC and 12.5 MA @ 67½ V DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer parallel with base of dial. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting. When adjusting A6 the chassis and batteries must be in their normal position in the cabinet to reflect the proper loop impedance.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to stator of rear section of tuning capacitor. Low side to chassis.	455KC	Tuning capacitor fully open	Across voice coil.	A1,A2, A3,A4.	Adjust for maximum output.
2	.1 MFD.	"	1400KC	1400KC	"	A5	" " " "
3		Loop	1400KC	Tune for maximum output.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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DATE 9/47 SET 23 FOLDER 4713-30

PARTS LIST AND DESCRIPTIONS

TRAV-LER MODEL 501

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	1R5	1R5	7AT	
2	IF Amp.	1U4	1U4	6AR	
3	Det.-AVC-AF	1S5	1S5	6AU	
4	Power Output	3S4	3S4	7BA	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRAV-LER PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
5	10	75	EC-11	BR1215	TC44	M-12-150	UT121	PRS150-12	Pwr. Supply Bypass
6	.006	600	PC-6	DT6D6	TP409	S-6-006	TC-26	684-006	Output Plate Bypass
7	.006	600	PC-6	DT6D6	TP409	S-6-006	TC-26	684-006	Audio Coupling
8	.01	400	PC-7	DT4S1	TP421	S-4-01	TC-11	484-01	AF Screen Bypass
9	.006	600	PC-6	DT6D6	TP409	S-6-006	TC-26	684-006	Audio Coupling
10	.01	400	PC-7	DT4S1	TP421	S-4-01	TC-11	484-01	AVC Filter
11	.01	400	PC-7	DT4S1	TP421	S-4-01	TC-11	484-01	Screen Decoupling
12	100	500	MC-2	5W5T1	MC235	M0.5-31	1FM-31	1468-0001	AF Plate Bypass
13	100	500	MC-2	5W5T1	MC235	M0.5-31	1FM-31	1468-0001	Diode Filter
14	100	500	MC-2	5W5T1	MC235	M0.5-31	1FM-31	1468-0001	Osc. Grid Cap.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRAV-LER PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
15A	1 Meg.	1	VC-8				Volume Control & Switch
B	Shaft		Not Req.				
C	Switch		" "				

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
16	220KΩ	½	1R-20	BTS-220K	Red-Red-Yl. Oscillator Grid
17	3.3 Meg.	½	1R-23	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
18	10KΩ	½	1R-37	BTS-10K	Br.-Blk.-Or. Voltage Dropping
19	82KΩ	½	1R-31	BTS-82K	Gray-Red-Or. Diode RF Filter
20	10 Meg.	½	1R-3	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
21	3.3 Meg.	½	1R-23	BTS-3.3 Meg.	Or.-Or.-Grn. AF Screen Dropping
22	1 Meg.	½	1R-12	BTS-1 Meg.	Br.-Blk.-Grn. AF Plate Load
23	2.2 Meg.	½	1R-13	BTS-2.2 Meg.	Red-Red-Grn. Output Grid
24	220Ω	½	1R-5	BW-½-220Ω	Red-Red-Br. Bias

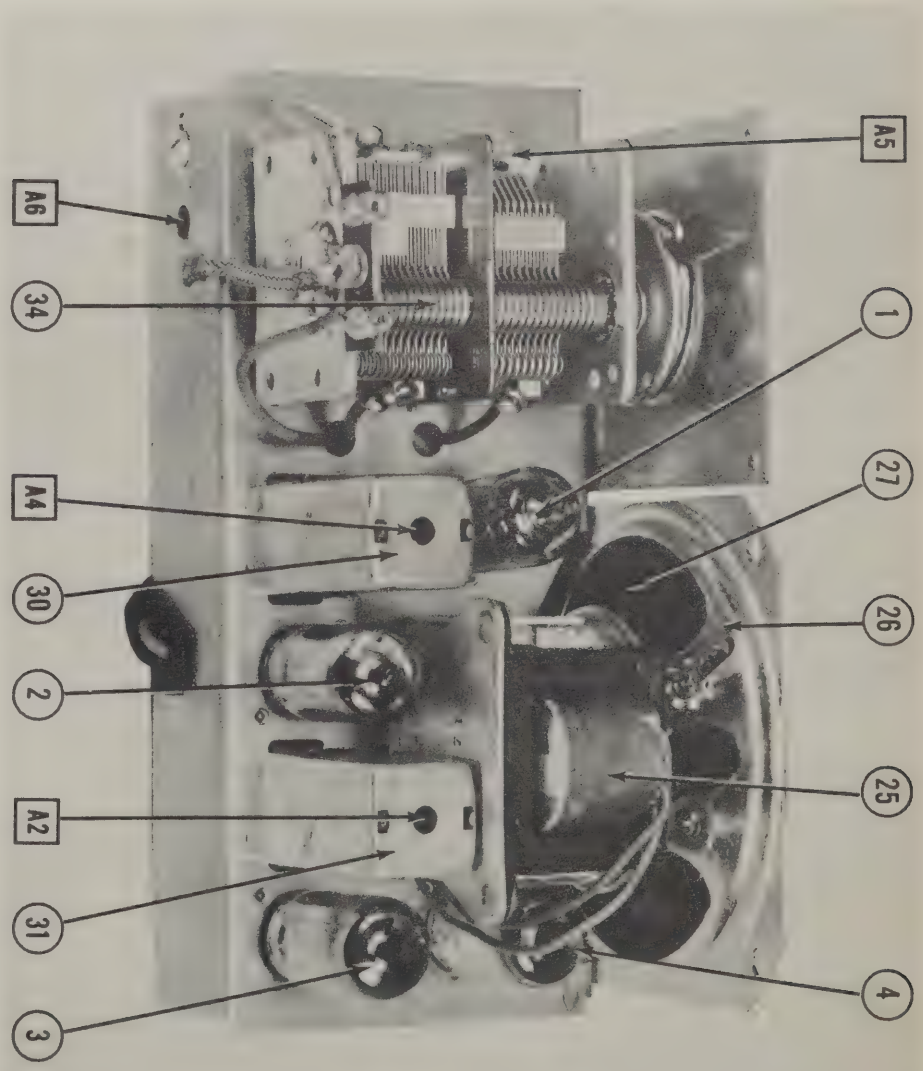
TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDAR'N PART No.	REPLACEMENT DATA:	INSTALLATION NOTES
25	3700Ω	3.2Ω	410Ω	.7Ω	Part of SPK-8		T22S46†		†Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: TRAV-LER PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.				
26	PM	3.2Ω	SPK-8			
	CONE DIA.	VC DIA.				
27	3-7/16"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

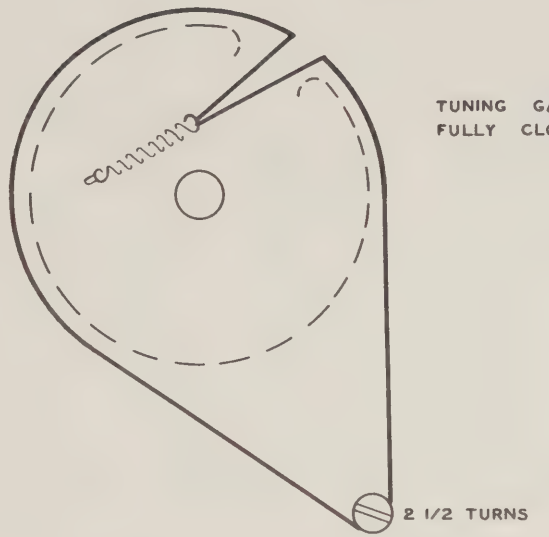
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA TRAV-LER PART No.	REPLACEMENT DATA MEISSNER PART No.	
28	Loop Ant.		1.6Ω	LL-8		
29	Osc. Coil	1.2Ω	7.2Ω	LO-12		
30	Input IF	22Ω	22Ω	LI-5		
31	Output IF	22Ω	22Ω	LI-5		

BATTERIES

ITEM No.	VOLTAGE	TRAV-LER PART No.	EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	INSTALLATION NOTES
32	1½V.		#950			2 Used in Parallel
33	67½V.			#467		

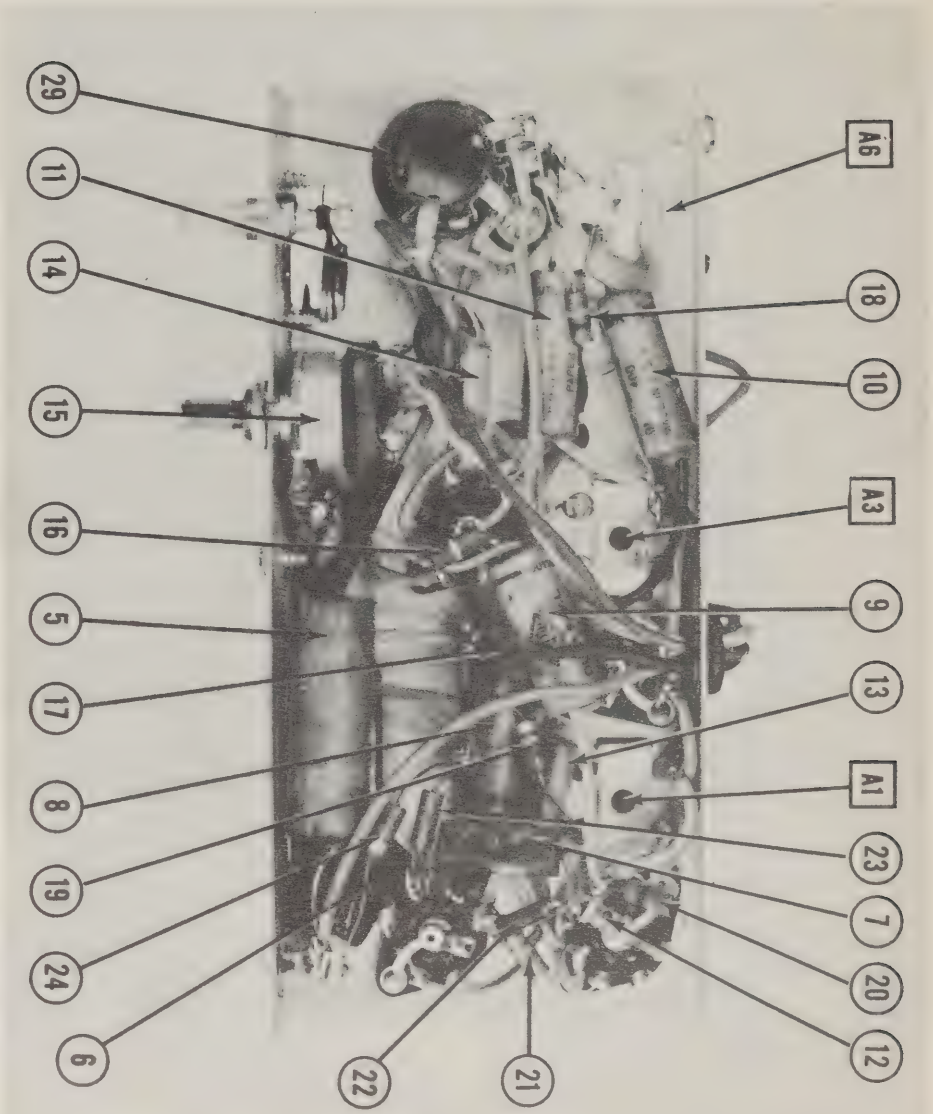
MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
34	Tuning Cap.	GC-4	(50-216 MMF, 37-468 MMF)
A6	Trimmer Cap.	TC-7	Ant. Adj.

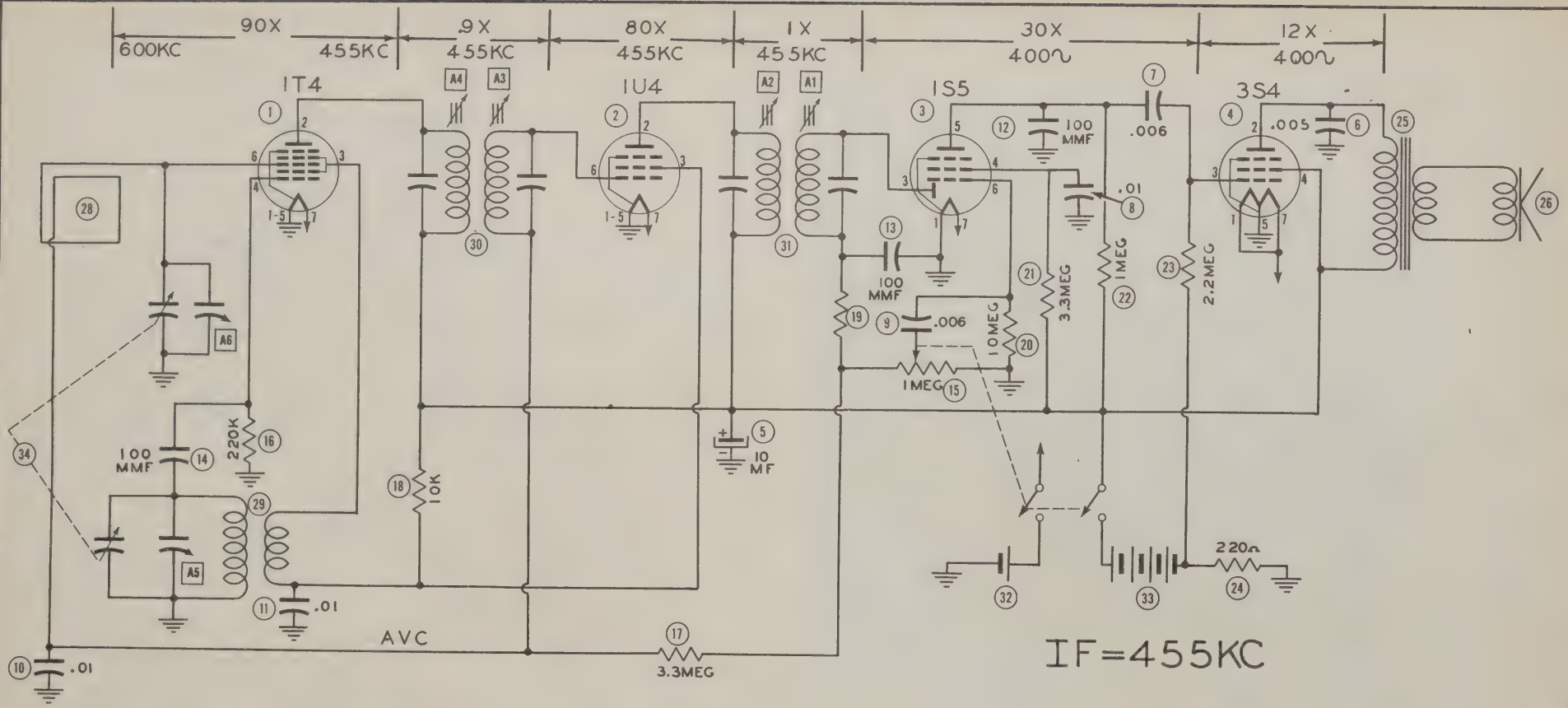


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



TRAV-LER MODEL 5019



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	0V.	65VDC	50VDC	-6.2VDC§	0V.	0V.	1.5VDC
2	1U4	0V.	65VDC	50VDC	0V.	0V.	0V.	1.5VDC
3	1S5	0V.	0V.	-.3VDC	25VDC	18VDC	0V.	1.5VDC
4	3S4	1.5VDC	61VDC	-.3VDC	65VDC	0V.	61VDC	1.5VDC

§TAKEN WITH VACUUM-TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	0Ω	100KΩ	110KΩ	210KΩ	0Ω	4 MEG.	*
2	1U4	0Ω	100KΩ	110KΩ	4 MEG.	0Ω	4 MEG.	*
3	1S5	0Ω	INF.	1.1 MEG.	3.3 MEG.	1.1 MEG.	10 MEG.	*
4	3S4	*	100KΩ	2.5 MEG.	100KΩ	0Ω	100KΩ	*

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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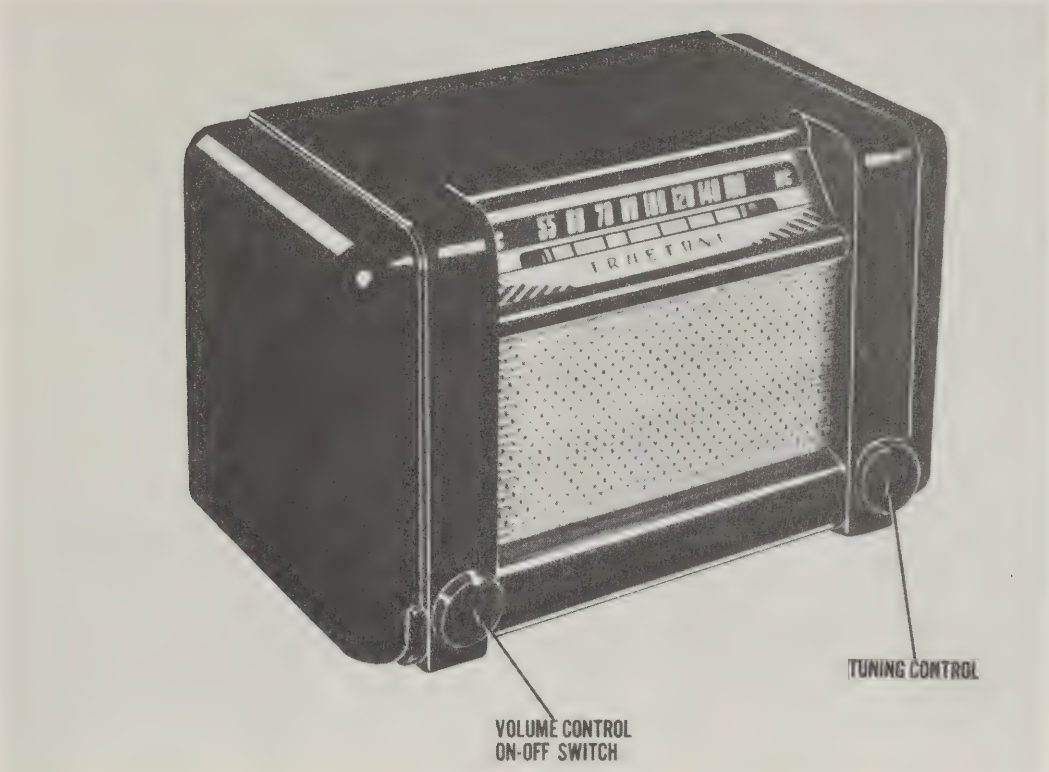
4713-30

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting to chassis.

1 - DC Voltage measurements are at 20,000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5 - Volume control at maximum, no signal applied for voltage measurements.



TRUETONE
MODEL D 2710

TRUETONE
MODEL D 2710

TRUETONE MODEL D2710

TRADE NAME	Truetone, Model D2710 (Factory Model 24D22-630BR)
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	AC-DC Operated Superheterodyne with Loop Antenna
TUBES (FIVE)	Types, 12SA7 Converter, 12SK7 IF Amp., 12SQ7 Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	105-125 Volts AC-DC
TUNING RANGE—BROADCAST	540-1600KC RATING .240 Amps. @ 117 V AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap fully closed and set pointer to index line at left end of dial backplate. Use isolation transformer if available. If not, connect a .1 MFD capacitor in series with low side of signal generator and chassis. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to Pin 4 (grid) 12SK7. Low side to chassis.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2,	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD. to reduce hum modulation.
2	.1 MFD.	High side to Pin 8 (grid) 12SA7. Low side to chassis.	"	"	"	A3,A4.	Adjust for maximum output.
3	.1 MFD.	"	1620KC	"	"	A5	" " " "
4	50 MMFD	High side to ext. ant. clip. Low side to ext. ground clip.	1400KC	Tune for maximum output.	"	A6	Adjust for maximum output.

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DATE 9/47 SET 23 FOLDER 4713-31

PARTS LIST AND DESCRIPTIONS

TRUETONE MODEL D2710

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7	12SA7	8R	
2	IF Amp.	12SK7	12SK7	8N	
3	Det.-AVC-AF	12SQ7	12SQ7	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	50	150	45X341	BRL5515	2N521	M-2x50-150	TA-505	PRSA150-50-50	Filter - Red
B	50	150							" - Blue
7	.05	400	D66503	DT4S5	TP426	S-4-05	TC-15	484-05	Line Filter
8	.005	400	D66502	DT6D5	TP408	S-6-005	TC-25	484-005	Output Plate Bypass
9	.01	200	B66103	DT4S1	TP421	S-4-01	TC-11	484-01	Audio Coupling
10	.01	200	B66103	DT4S1	TP421	S-4-01	TC-11	484-01	" "
11	.05	200	B66503	DT4S5	TP426	S-4-05	TC-15	484-05	AVC Filter
12	220	500	47X468	5W5T25	MC240	MO.5-322	1FM-325	1468-00025	Audio Plate Bypass
13A	50	500	47X112	5W5Q5	MC225	MO.5-45	1FM-45	1468-00005	Diode Filter
B	50	500		5W5Q5	MC225	MO.5-45	1FM-45	1468-00005	" "

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
14A	500KΩ	1	36X352	MK401	D13-133	AM-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 14A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

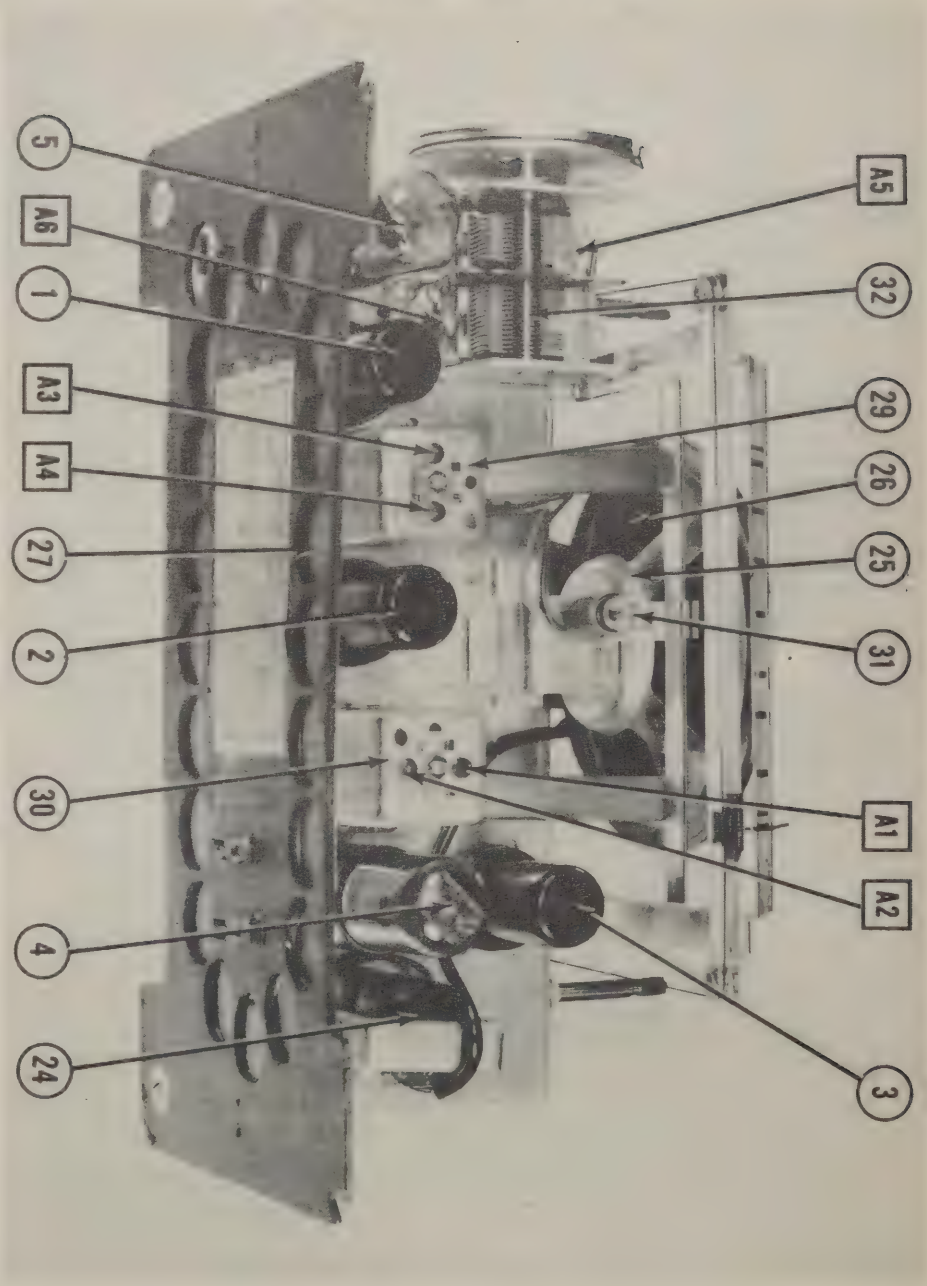
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
15	22KΩ	½	B84223	BTS-22K	Red-Red-Or. Oscillator Grid
16	2.2 Meg.	½	B85225	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
17	47KΩ	½	B85473	BTS-47K	Yl.-Vi.-Or. Diode RF Filter
18	6.8 Meg.	½	B85685	BTS-6.8 Meg.	Blue-Gray-Grn. AF Grid
19	470KΩ	½	B84474	BTS-470K	Yl.-Vi.-Yl. AF Plate Load
20	470KΩ	½	B85474	BTS-470K	Yl.-Vi.-Yl. Output Grid
21	150Ω	½	B84151	BW-½-150	Br.-Grn.-Br. Output Cathode
22	1500Ω	1	C85152	BTA-1500	Br.-Grn.-Red Filter
23	27Ω	½	B84270	BW-½-27	Red-Vi.-Blk. Rectifier Ballast

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDAR'N PART No.		INSTALLATION NOTES
24	1800Ω	2.9Ω	170Ω	.6Ω	51X132	A-3876	T22S45		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: TRUETONE PART No.	JENSEN PART No.		INSTALLATION NOTES
25	FIELD / PM	VC IMP. / 2.5Ω	12A473	ST-105* / Mod. P5-X		*Fabricate new mounting bracket.
26	CONE DIA. / 4-3/4"	VC DIA. / 1/2"	ORDER FROM MANUFACTURER - SPECIFY PART NUMBER AND LETTERS STAMPED ON SPEAKER.			

R F COILS

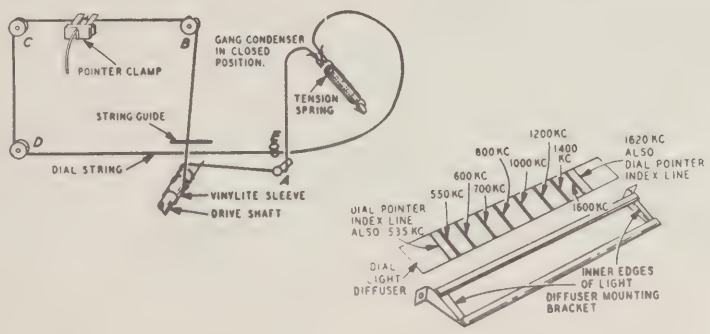
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: TRUETONE PART No.	MEISSNER PART No.
27	Loop Ant.	.1Ω	1.2Ω	9A1912	
28	Osc. Coil		6Ω	9A1914	
29	Input IF	22Ω	22Ω	9A1808	16-6658
30	Output IF	23Ω	20Ω	9A1809	16-6660

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: TRUETONE PART No.		INSTALLATION NOTES
31	Bayonet	6-8	0.15	Brown			Type 47

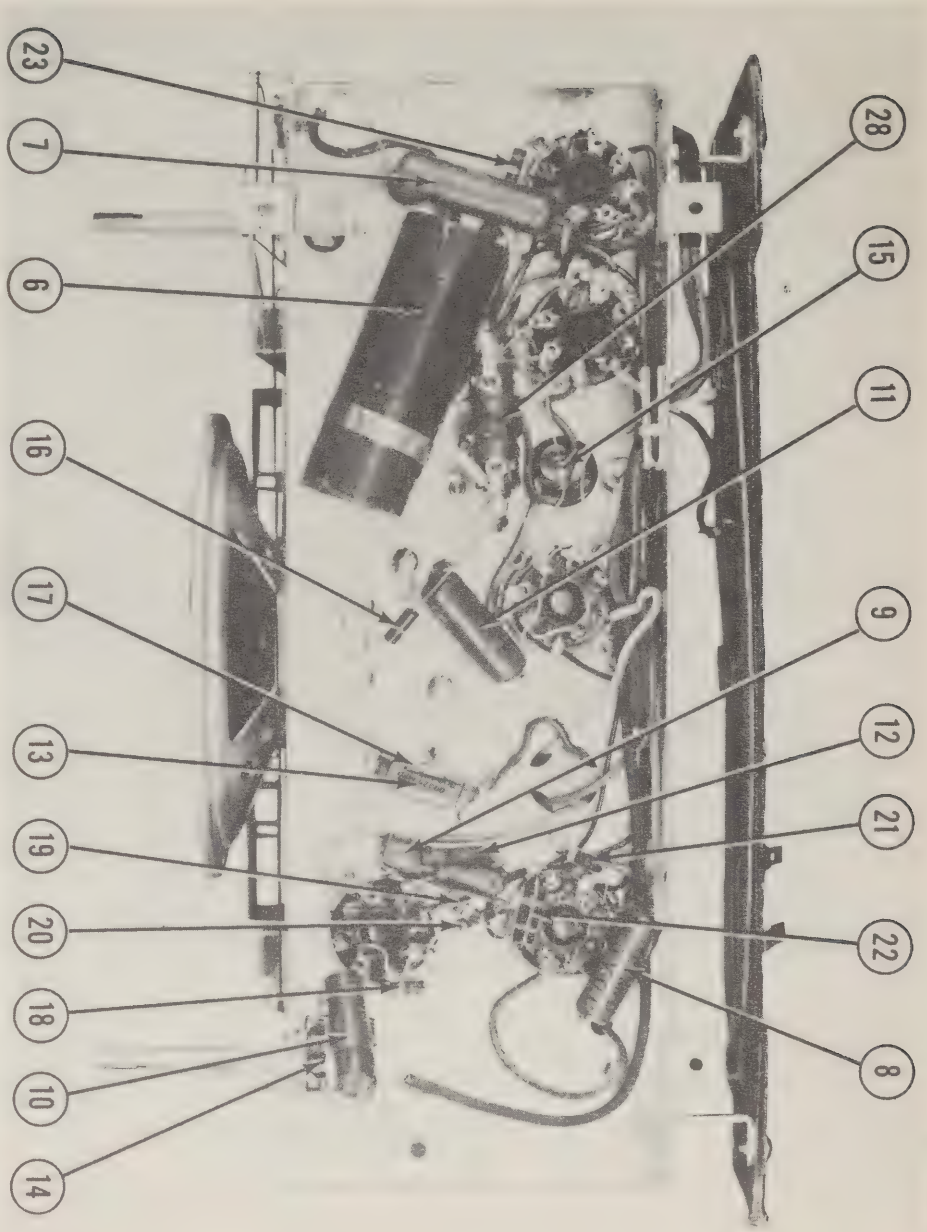
MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
32	Tuning capacitor	14A194	(35-470 MMF, 42-205 MMF)
	Cabinet	55X262	Plastic
	Knob	10A297	
	Pointer	15X223	
	Dial	58X683	



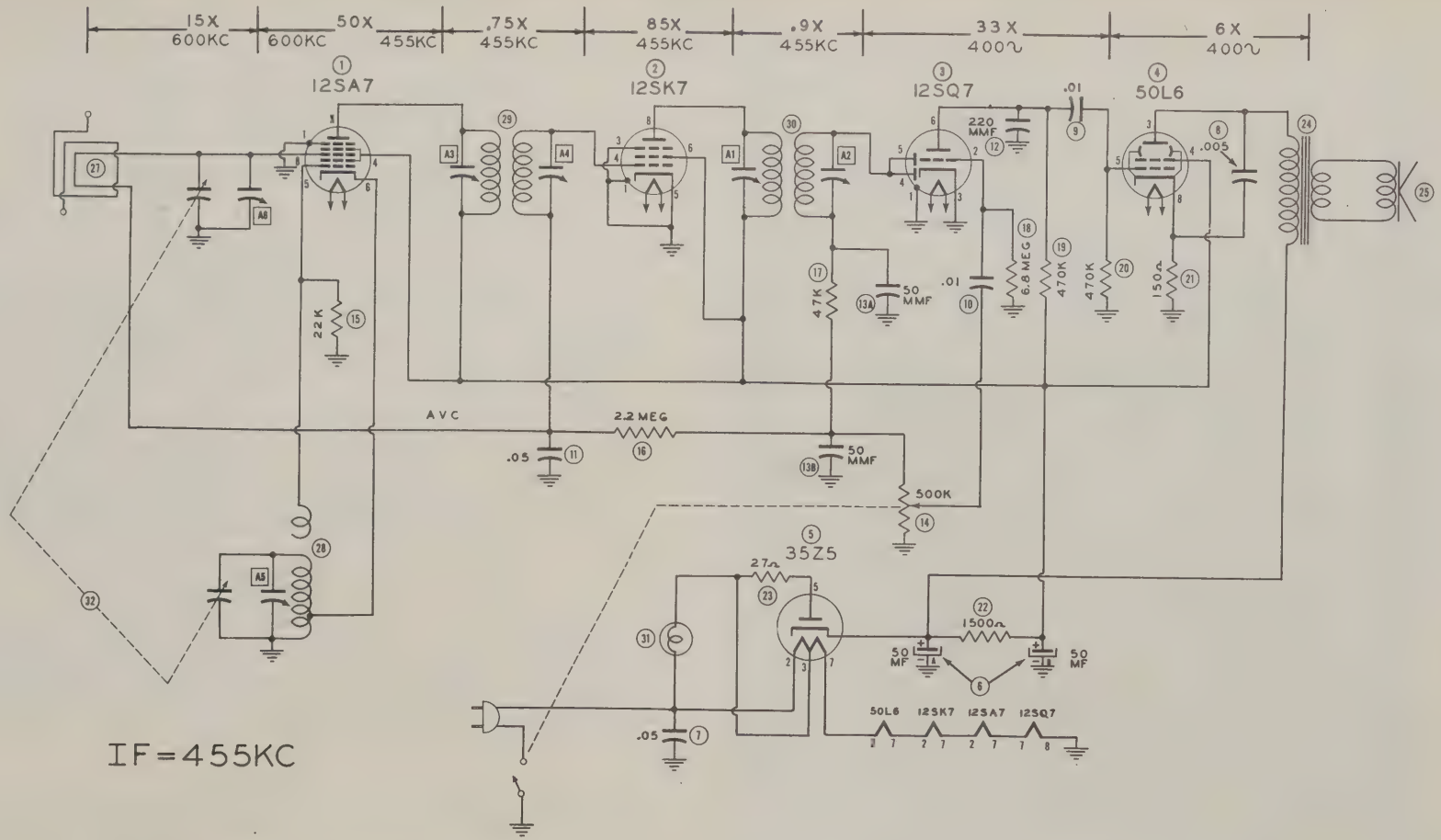
DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



TRUETONE MODEL D2710

TRUETONE MODEL D2710



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	0V.	24VAC	82VDC	82VDC	-7VDC §	0V.	12VAC	-.6VDC
2	12SK7	0V.	37VAC	0V.	-.6VDC	0V.	82VDC	24VAC	82VDC
3	12SQ7	0V.	-.6VDC	0V.	-.5VDC	-.5VDC	42VDC	12VAC	0V.
4	50L6GT	0V.	87VAC	110VDC	82VDC	0V.	117VDC	37VAC	5VDC
5	35Z5GT	0V.	117VAC	112VAC	0V.	111VAC	0V.	87VAC	117VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	0Ω	24Ω	50KΩ	50KΩ	21KΩ	.8Ω	12Ω	2.8 Meg.
2	12SK7	0Ω	34Ω	0Ω	2.8 Meg.	0Ω	50KΩ	24Ω	50KΩ
3	12SQ7	0Ω	7 Meg.	0Ω	500KΩ	500KΩ	520KΩ	12Ω	0Ω
4	50L6GT	INF	80Ω	50KΩ	50KΩ	450KΩ	50KΩ	34Ω	150Ω
5	35Z5GT	INF	107Ω	105Ω	INF	130Ω	INF	80Ω	50KΩ

§TAKEN WITH A VACUUM TUBE VOLTMETER.

4713-31

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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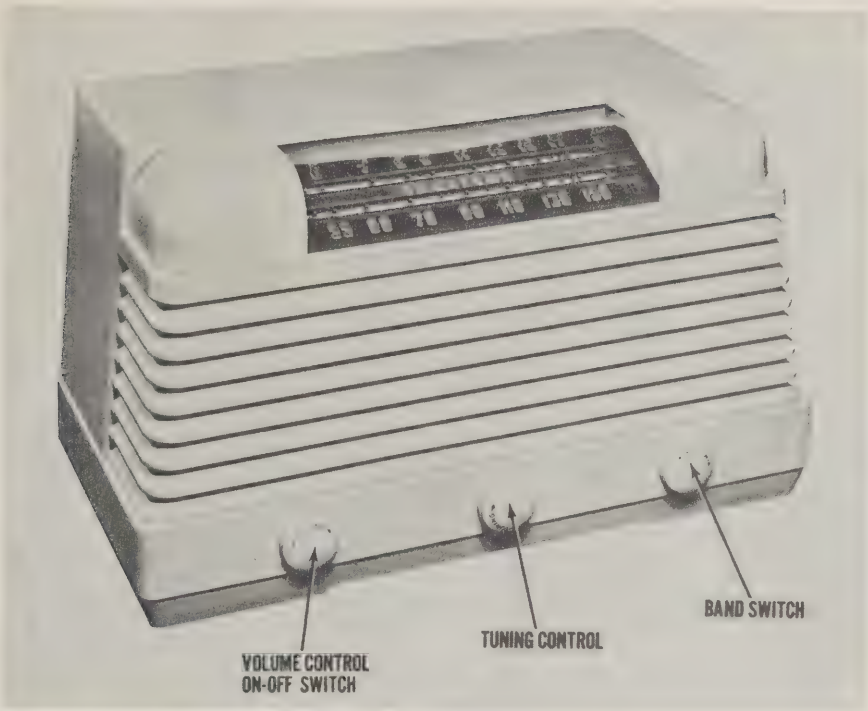
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**



TRUETONE MODEL D2718

TRADE NAME	Truetone, Model D2718 (Factory Model 227D14-638IV)
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	AC-DC Operated 2 Band Receiver with Loop Antenna
TUBES (SEVEN)	Types, 12SA7 Converter, 12SK7 1st IF Amp., 6SS7 2nd IF Amp., 12SQ7 Det.-AVC, 12SJ7 AF Amp., 35L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	105-125 Volts AC-DC
TUNING RANGE—BROADCAST	540-1600KC
RATING	.240 Amps. @ 117 V AC
SHORT WAVE	6 - 18MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not, connect a .1 MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning cap. Low side to Pin 3 of 6SK7.	455KC	BC (counter clockwise	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD. to reduce hum modulation.
2	200MMFD	High side to ext. ant. clip. Low side to chassis.	1600KC	"	"	"	A5	Adjust trimmer on front side of chassis for max. output. Trimmer on tuning cap. gang is auxiliary trimmer adjusted at factory.
3	200MMFD	"	1400KC	"	Tune for maximum output.	"	A6	Adjust for maximum output Set pointer at 1400 on the dial. (Some models will not have this adjustment. On these, set pointer to 1600 on dial after Step 2 and omit Step 3.)
4	200MMFD	"	600KC	"	"	"	A7	Rock tuning cap and adjust for maximum output. Repeat Steps 2, 3 and 4 until no further improvement can be made.
5	400Ω carbon resistor	"	18.3MC	SW (clockwise	18.3MC	"	A8	Adjust for maximum output
6	"	"	17MC	"	Tune for maximum output.	"	A9	Rock tuning cap. and adjust for maximum output. Install receiver in cabinet and repeat Step 3.

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PARTS LIST AND DESCRIPTIONS

TRUETONE MODEL D271

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7	12SA7	8R	
2	1st IF Amp.	12SK7	12SK7	8N	
3	2nd IF Amp.	6SS7	6SS7	8N	
4	Det.-AVC	12SQ7	12SQ7	8Q	
5	AF Amp.	12SJ7	12SJ7	8N	
6	Power Output	35L6GT	35L6GT	7AC	
7	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
8A	50	150	45X342	EDJ10405	2N521	DSB-304	TA-505	PRSA-50502	Filter - Red
B	50	150							" - Green
C	20	25			TC26		TA-25		Cath. Bypass-Yellow
9	.2	400	D67204	DT4P2	TP429	S-4-2	TC-2	484-.2	Line Isolation
10	.1	400	D67104	DT4P1	TP428	S-4-1	TC-1	484-.1	Line Filter
11	.01	200	B66103	DT4S1	TP421	S-4-01	TC-11	484-01	Output Plate Bypass
12	.01	200	B66103	DT4S1	TP421	S-4-01	TC-11	484-01	Audio Coupling
13	.025	200	B67253	DT4S25	TP451	S-4-025	TC-13	484-025	Audio Plate Decoup.
14	.1	200	B66104	DT4P1	TP428	S-4-1	TC-1	484-.1	Audio Screen Bypass
15	.005	200	B66502	DT6D5	TP408	S-6-005	TC-25	484-005	Audio Coupling
16	.04	200	B66403	DT4S4	TP425	S-4-04	TC-14	484-04	Tone Compensation
17	.04	200	B66403	DT4S4	TP425	S-4-04	TC-14	484-04	AVC Filter
18	.1	200	B66104	DT4P1	TP428	S-4-1	TC-1	484-.1	" "
19	.04	200	B66403	DT4S4	TP425	S-4-04	TC-14	484-04	Conv. Screen Bypass
20	.00475	180	46X289						Fixed Padder *
21	.001	200	B67102	DT6D1	TP408	S-6-001	TC-21	484-001	Ant. Isolation
22	470	500	47X467	5W5T5	MC245	MO.5-347	1FM-35	1468-0005	Audio Plate Bypass
23	47	500	47X446	5W5Q5	MC225	MO.5-447	1FM-45	1468-00005	Tone Compensation
24	100	500	47X476	5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Diode Filter
25	47	500	47X463	5W5Q5	MC225	MO.5-447	1FM-45	1468-00005	" "
26	47	500	47X446	5W5Q5	MC225	MO.5-447	1FM-45	1468-00005	IF Coupling
27	68	500	47X466	5W5Q7	MCB230	MOS.5-47	MS-47	1469-00007	Osc. Grid Capacitor

*Replacement should be an exact value. A value of .005 may be used with a slight decrease of sensitivity and tracking on short wave band.

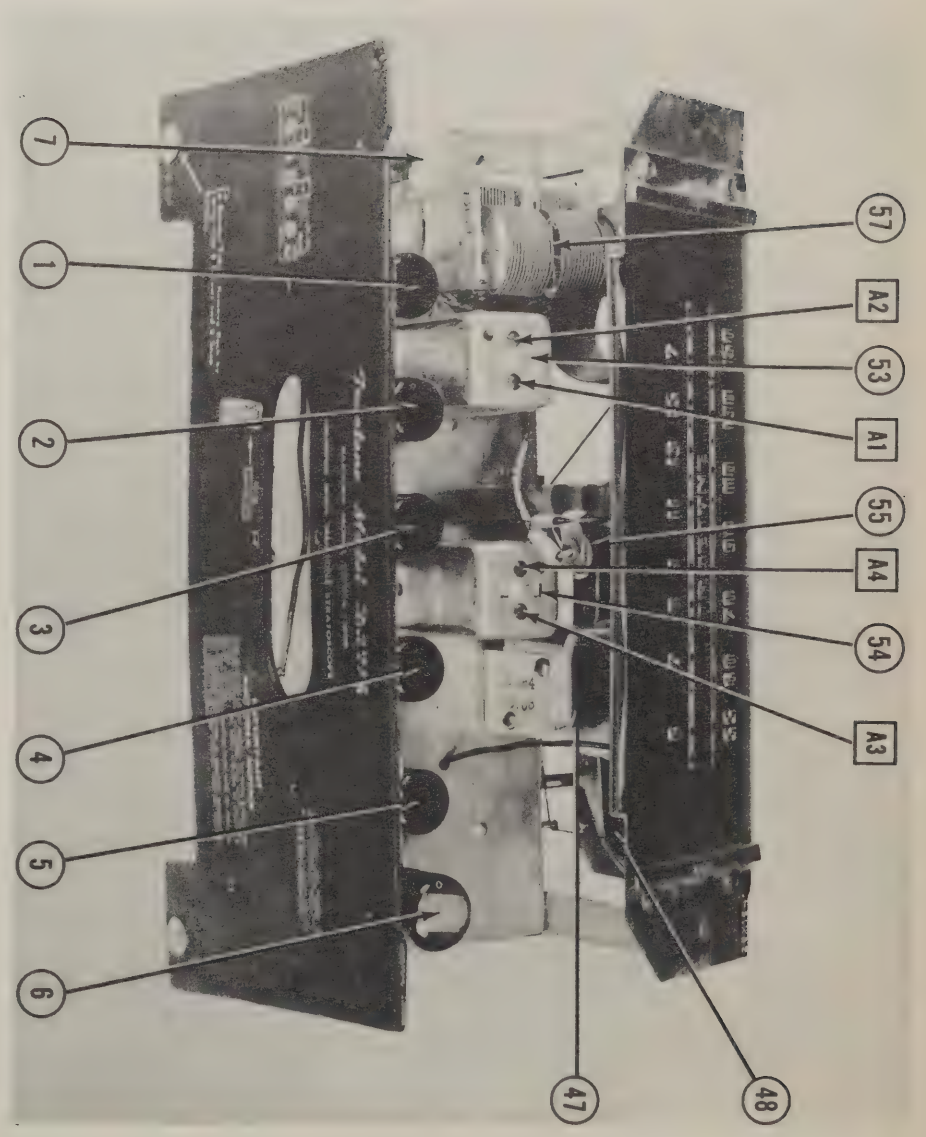
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
28A	500KΩ	1	36X309	TM227	D13-133X	AT-78	Volume Control
B	Shaft		Not Req.	SS25	E	KSS-3	Attach to 28A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	IDENTIFICATION CODES
29	39KΩ	½	B84393	BTS-39K	Or.-White-Or. Oscillator Grid
30	4700Ω	½	B84472	BTS-4700	Yl.-Vi.-Red Converter Screen Dropping
31	47KΩ	½	B85473	BTS-47K	Yl.-Vi.-Or. AVC Network
32	3300Ω	½	B84332	BTS-3300	Or.-Or.-Red 1st IF Plate Load
33	47KΩ	½	B85473	BTS-47K	Yl.-Vi.-Or. 2nd IF Grid
34	100K	½	B85104	BTS-100K	Br.-Blk.-Yl. Diode RF Filter
35	2.2 Meg.	½	B85225	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
36	15KΩ	½	B84153	BTS-15K	Br.-Grn.-Or. Tone Compensation
37	4.7 Meg.	½	B85475	BTS-4.7 Meg.	Yl.-Vi.-Grn. AF Grid
38	470KΩ	½	B85474	BTS-470K	Yl.-Vi.-Yl. AF Screen Dropping
39	33KΩ	½	B84333	BTS-33K	Or.-Or.-Or. AF Plate Load
40	82KΩ	½	B84823	BTS-82K	Gray-Red-Or. AF Plate Decoupling
41	470KΩ	½	B85474	BTS-470K	Yl.-Vi.-Yl. Output Grid
42	180Ω	½	B84181	BW-½-180	Br.-Gray-Br. Output Cathode
43	1500Ω	1	C85152	BTA-1500	Br.-Grn.-Red Filter
44	27Ω	½	B84270	BW-½-27	Red-Vi.-Blk. Surge Limiter
45	220KΩ	½	B85224	BTS-220K	Red-Red-Yl. Line Isolation

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA TRUETONE PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
46	3500Ω	3.4Ω	350Ω	.7Ω	51X115	A-3876	T2S546		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA TRUETONE PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.				
47	F.	3.4Ω	18A464			
	CONE DIA.	VC DIA.				
48	4" [illegible]	1/2"	CONE HAS SPECIAL ADJUSTMENT FEATURE-ORDER FROM MANUFACTURER. SPECIFY PART NO. AND LETTER STAMPED ON SPEAKER.			

R F COILS

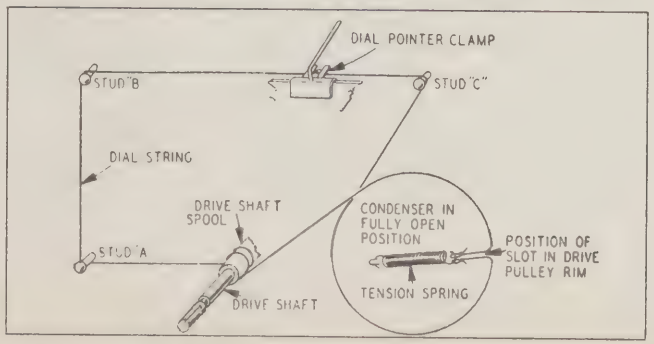
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA TRUETONE PART No.	MEISSNER PART No.	
49A	Loop Ant.	0Ω	2Ω	26A451		Used with Ivory Cabinet
B	" "	0Ω	2Ω	26A452		" " Brown "
50	SW Ant.Coil	.5Ω	.1Ω	9A1443	14-1044	
51	BC Osc.Coil	.1Ω	5.8Ω	9A1442	14-1040	
52	SW Osc.Coil	.2Ω	.1Ω	9A1444	14-1046	
53	Input IF	20Ω	19Ω	9A1793	16-6658	
54	Output IF	20.5Ω	17.5Ω	9A1794	16-6660	

DIAL LIGHT

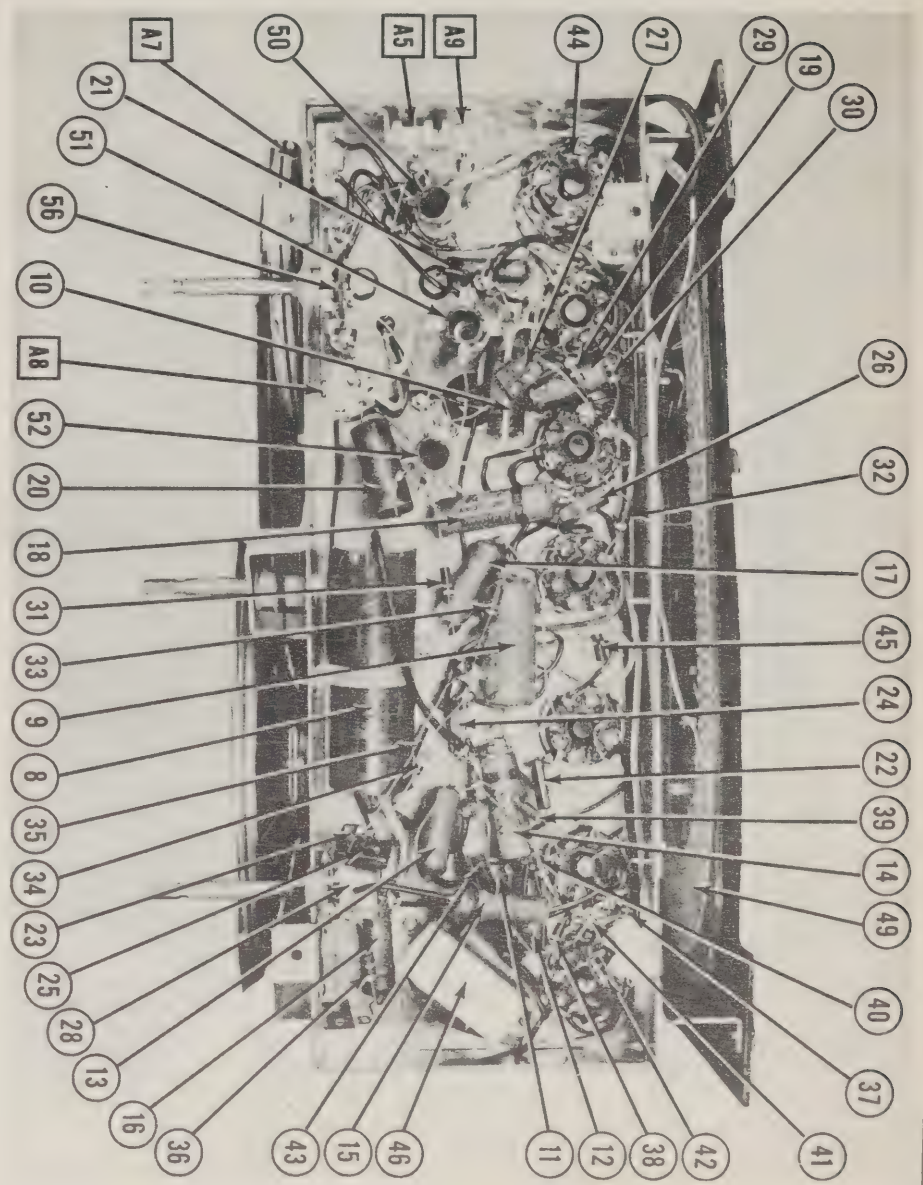
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA TRUETONE PART No.		INSTALLATION NOTES
55	Bayonet	6-8	0.15	Brown			Type 47

MISCELLANEOUS

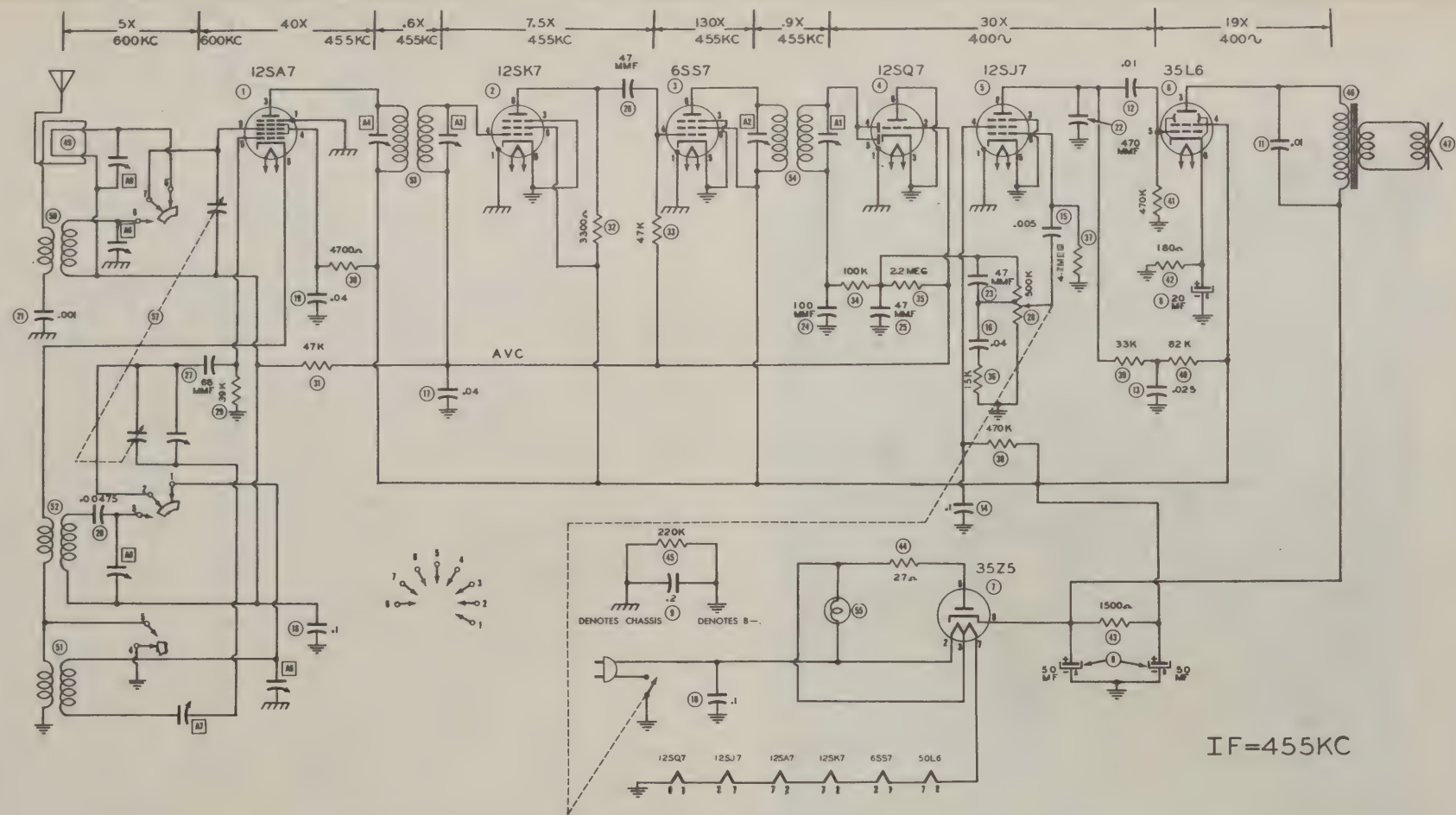
ITEM No.	PART NAME	TRUETONE PART No.	NOTES
56	Band Switch	2A206	
57	Tuning Capacitor	14A148	(13-450 MMF, 13-450 MMF)
A5	Trimmer Strip	17A152	BC Osc. Adj. (2-25 MMF)
A9			SW Ant. Adj. (2-25 MMF)
A6	Trimmer Cap.	17A123	BC Ant. Adj. (1.5-12MMF)
A7	" "	17A234	BC Osc. Padder (250-525 MMF)
A8	" "	17A174	SW Osc. Adj. (2-25 MMF)
	Cabinet	55X292	Ivory Plastic
	"	55X296	Brown "
	Dial	58X671	(For Ivory Cabinet)
	Pointer	15X236	



CHASSIS—BOTTOM VIEW



TRUETONE MODEL D2718



VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	0V.	38VAC	78VDC	59VDC	-5VDC$	0V.	26VAC	-.35VDC
2	12SK7	0V.	50VAC	0V.	-.65VDC	0V.	78VDC	38VAC	50VDC
3	6SS7	0V.	50VAC	0V.	-.4VDC	0V.	78VDC	55VAC	78VDC
4	12SQ7	0V.	-.65VDC	0V.	-.4VDC	-.4VDC	0V.	12VAC	0V.
5	12SJ7	0V.	12VAC	0V.	-.55VDC	0V.	25VDC	26VAC	28VDC
6	35L6GT	0V.	87VAC	110VDC	78VDC	0V.	0V.	55VAC	4.6VDC
7	35Z5GT	0V.	117VAC	113VAC	0V.	111VAC	0V.	87VAC	120VDC

$TAKEN WITH VACUUM-TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	200KΩ	35Ω	45Ω	50KΩ	40KΩ	.5Ω	24Ω	2.6 MEG.
2	12SK7	200KΩ	46Ω	0Ω	2.6 MEG.	0Ω	45KΩ	35Ω	48KΩ
3	6SS7	200KΩ	46Ω	0Ω	2.7 MEG.	0Ω	45KΩ	52Ω	45KΩ
4	12SQ7	200KΩ	2.6 MEG.	0Ω	580KΩ	580KΩ	0Ω	12Ω	0Ω
5	12SJ7	200KΩ	12Ω	0Ω	4.5 MEG.	0Ω	510KΩ	24Ω	160KΩ
6	35L6GT	INF.	81Ω	45KΩ	45KΩ	480KΩ	0Ω	52Ω	170Ω
7	35Z5GT	INF.	110Ω	108Ω	0Ω	132Ω	INF	81Ω	45KΩ

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC.
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4713-32

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

WOOLAROC
MODEL 3-12 A/3 (BATTERY OPERATED)

WOOLAROC
MODEL 3-12 A/3 (BATTERY OPERATED)

WOOLAROC MODEL 3-12A/3

TRADE NAME	Woolaroc Model 3-12A/3
SUPPLIER	Phillips Petroleum Co., Bartlesville, Okla.
TYPE SET	Three Power Portable Superheterodyne Receiver with Loop Antenna
TUBES (SIX)	Types, 1A7GT Converter, 1N5GT 1st IF Amp., 1N5GT 2nd IF Amp., 1H5GT Det.-AVC-AF, 3Q5GT Power Output, 117Z6GT Rectifier.
POWER SUPPLY	110-120 Volts AC-DC or 9 Volt "A" Supply and 90 Volt "B" Supply
RATING	.200 Amps. @ 117V AC or 55MA @ 9V DC and 10MA @ 90V DC
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial. Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1 MFD capacitor in series with the low side of the signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01 MFD.	High side to rear stator of tuning cap. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil.	A1,A2, A3,A4.	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy ant. to 200 MMF to reduce hum modulation.
2		Loop	1700KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1550KC	"	"	A6	Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: WOOLAROC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter		1A7GT	7Z	
2	1st IF Amp.		1N5GT	5Y	
3	2nd IF Amp.		1N5GT	5Y	
4	Det.-AVC-AF		1H5GT	5Z	
5	Power Output		3Q5GT	7AP	
6	Rectifier		117Z6GT	7Q	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: WOOLAROC PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	40	150		EZ44315C*		DY-3x40-150		PRSA150/40-	Filter - Red
B	40	150						40	" - Blue
C	20	150				M-20-150		PRSA150/40-	" - Green
D	40	150		BR4015				20	Fil. Bypass-Orange
8	.1	600		DT6P1	TP418	S-6-1	TC-1	684-.1	Line Bypass
9	.25	200		DT4P25	TP430	S-4-25	TC-2	484-.25	RF Bypass Pwr. Supp.
10	.05	400		DT4S5	TP426	S-4-05	TC-15	484-05	Fil. Bypass
11	.05	400		DT4S5	TP426	S-4-05	TC-15	484-05	Fil. Bypass
12	.05	400		DT4S5	TP426	S-4-05	TC-15	484-05	" "
13	.25	200		DT4P25	TP430	S-4-25	TC-2	484-.25	Line Isolating
14	.002	600		DT6D2	TP405	S-6-002	TC-22	684-002	Output Plate Bypass
15	.002	600		DT6D2	TP405	S-6-002	TC-22	684-002	Audio Coupling
16	.01	600		DT6S1	TP410	S-6-01	TC-11	684-002	" "
17	.05	400		DT4S5	TP426	S-4-05	TC-15	484-05	AVC Filter
18	.05	200		DT4S5	TP426	S-4-05	TC-15	484-05	" "
19	.01	600		DT6S1	TP410	S-6-01	TC-11	684-01	Conv. Screen Bypass
20	.05	600		DT6S5	TP415	S-6-05	TC-15	684-05	AVC Filter
21	92	500		5W5T1	MC235	MO.5-31	1FM-31	1468-0001	AF Plate Bypass
22	100	500		5W5T1	MC235	MO.5-31	1FM-31	1468-0001	IF Coupling
23	92	500		5W5T1	MC235	MO.5-31	1FM-31	1468-0001	Osc. Grid Cap.

*Omit one section.

CONTROLS

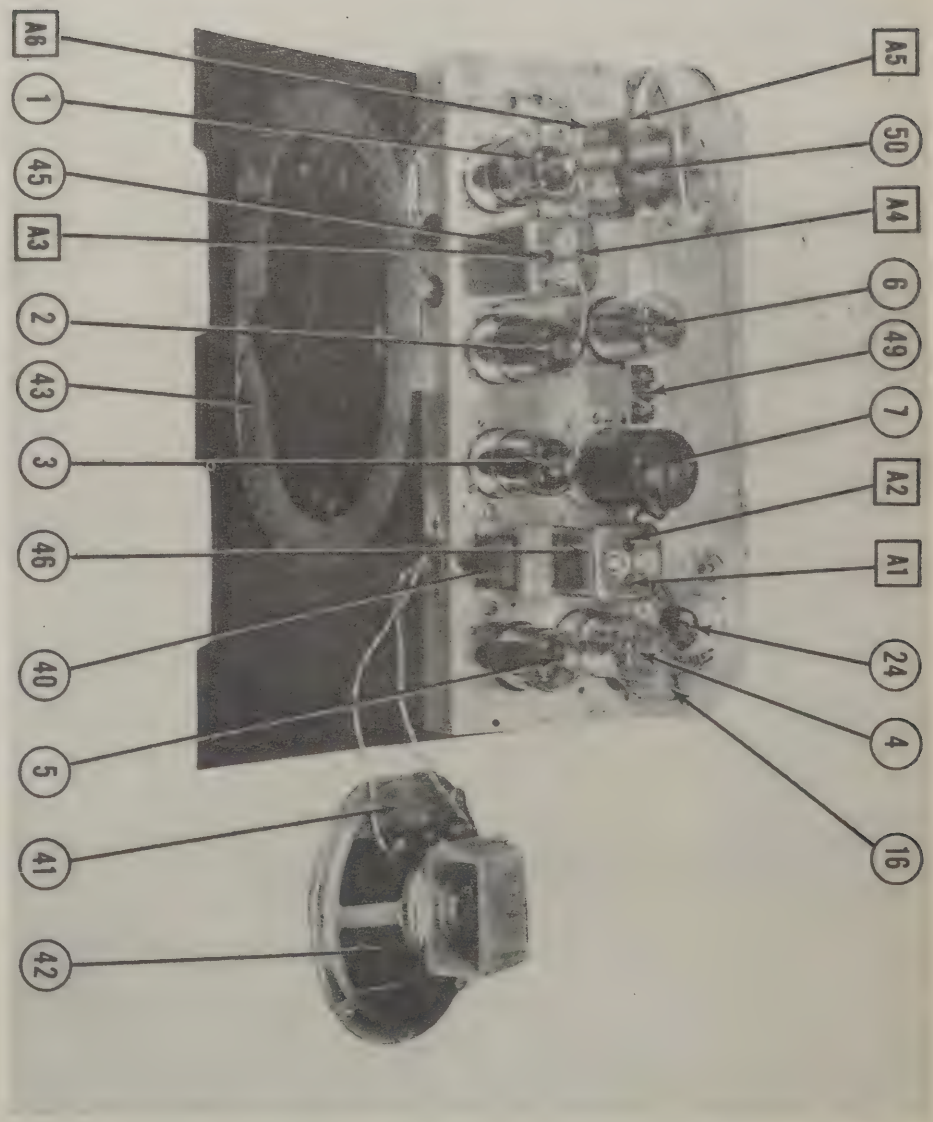
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WOOLAROC PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
24A	500KΩ	1		MK401	D13-133	AM-60-Z	Volume Control
B	Shaft			Not Req.	E	KSS-3	Attach to 24A per instructions
C	Switch			M26	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WOOLAROC PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
25	220KΩ	½		BTS-220K	Red-Red-Yl. Oscillator Grid
26	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Converter Screen Dropping
27	10KΩ	½		BTS-10K	Br.-Blk.-Or. 1st IF Plate Load
28	10KΩ	½		BTS-10K	Br.-Blk.-Or. 2nd IF Grid-See Note 1
29	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. AVC Network
30	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. " "
31	3.9 Meg.	½		BTS-3.9 Meg.	Or.-White-Grn. " "
32	3.9 Meg.	½		BTS-3.9 Meg.	Or.-White-Grn. AF Grid
33	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. AF Plate Load
34	1.2 Meg.	½		BTS-1.2 Meg.	Br.-Red-Grn. Output Grid
35	820Ω	½		BTS-820	Gray-Red Br. Filament String
36	820Ω	½		BTS-820	Gray-Red-Br. " " "
37	2200Ω	1		BTA-2200	Red-Red-Red Filter
38	15Ω	2		BW-2-15	Surge Limiter
39A	1200Ω	10		ABA-2500	Filament String-See Note 2
B	1350Ω				" "

Note 1 - Some models use 15KΩ in this application. IRC replacement BTS-15K.
Note 2 - On IRC replacement set slider at center.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		WOOLAROC PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
40	8400Ω	3.2Ω	700Ω	.75Ω		A-3878**	T22S47**		**Drill new mounting holes.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			WOOLAROC PART No.	JENSEN PART No.		
41	FIELD PM	VC IMP. 3.2Ω	EH6-3	ST-107 Mod. P5-V		
42	CONE DIA. 4"	VC DIA. 1"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

R F COILS

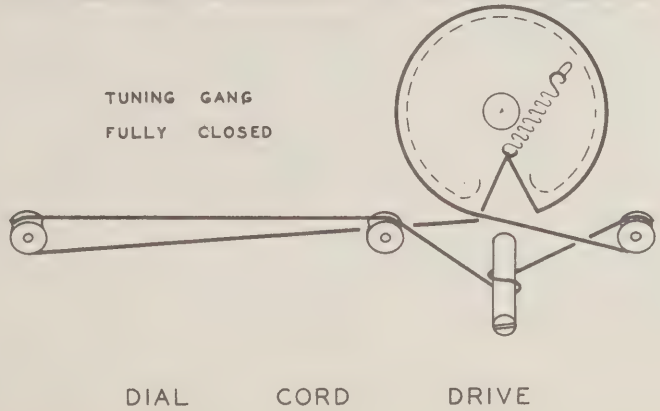
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	WOOLAROC PART No.	MEISSNER PART No.	
43	Loop		1.2Ω			
44	Osc. Coil	1.5Ω	6.3Ω	LO-1	14-1040	
45	Input IF	10.5Ω	18.5Ω	TM2-12		
46	Output IF	13.5Ω		TM2-13		

BATTERIES

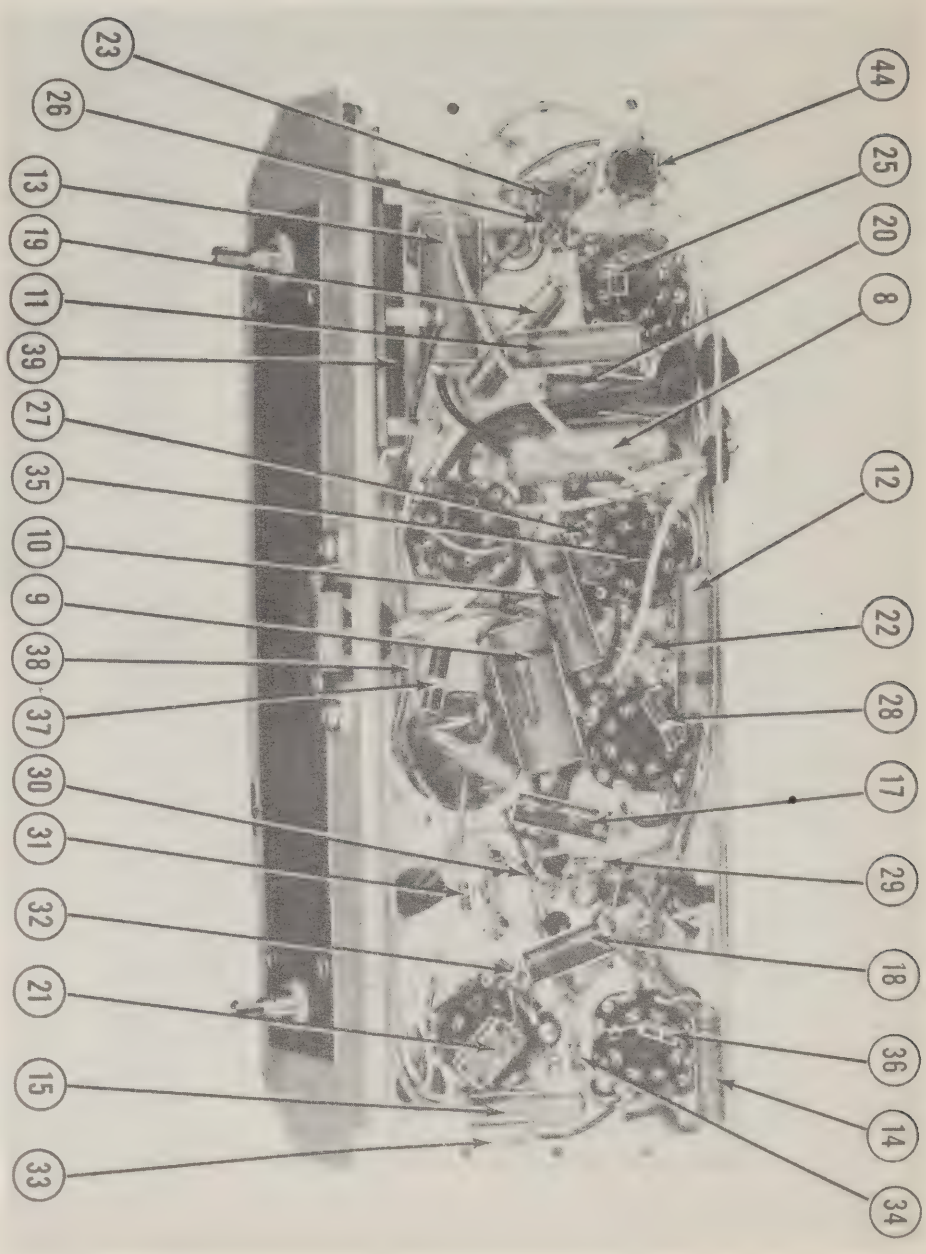
ITEM No.	VOLTAGE	WOOLAROC PART No.	EVEREADY			INSTALLATION NOTES
			"A"	"B"	"A-B"	
47	9V "A"		#746			2 Used in Series
48	90V "B"			#482		" " " "

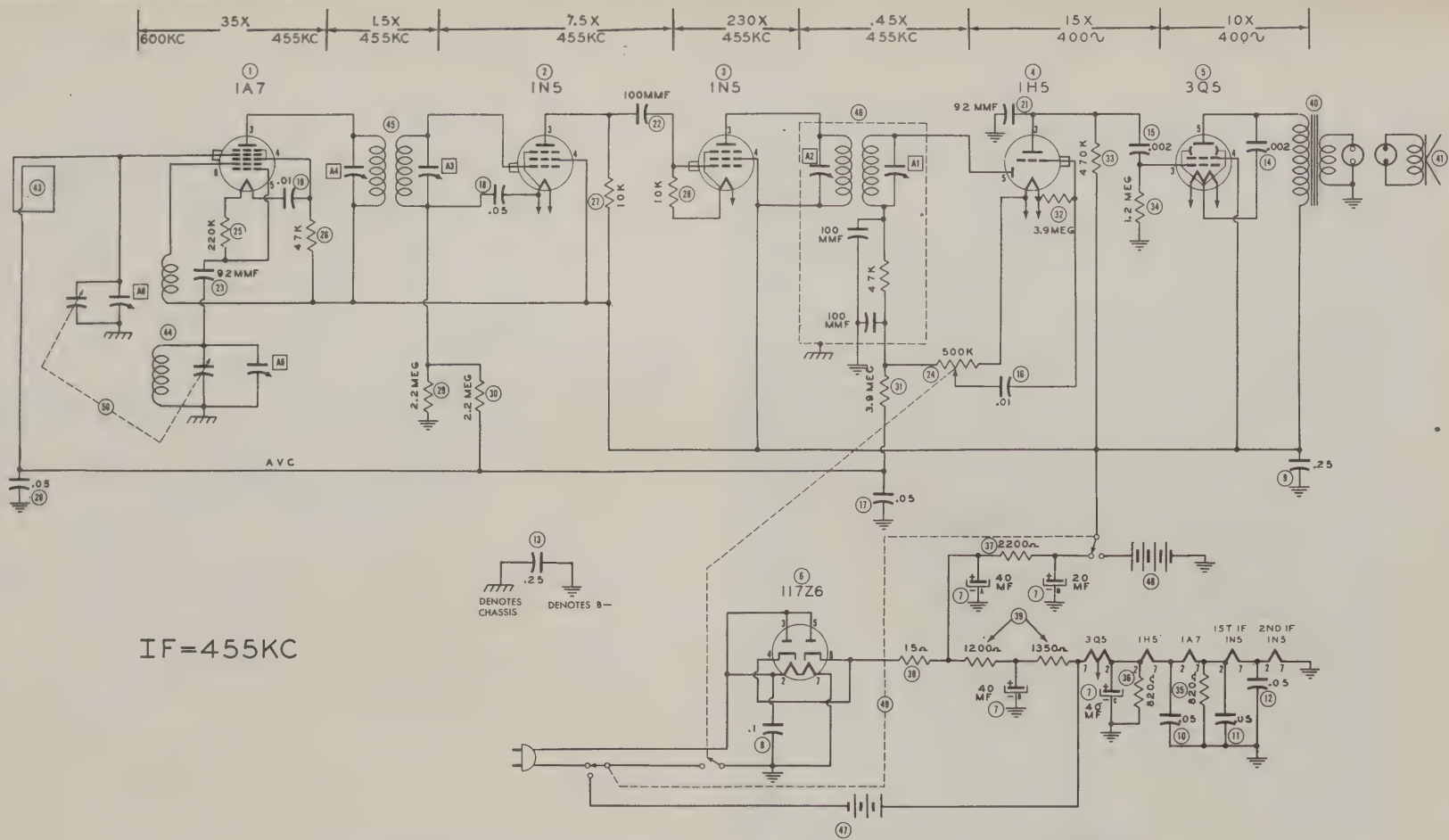
MISCELLANEOUS

ITEM No.	PART NAME	WOOLAROC PART No.	NOTES
49	Switch		Power Change
50	Tuning Capacitor		(23-187 MMF, 28-468 MMF)



CHASSIS—BOTTOM VIEW





VOLTAGE AND RESISTANCE READINGS TAKEN IN AC-DC POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	1A7GT	0V.	4.6VDC	100VDC	53VDC	-5VDC$	100VDC	3.3VDC	1VDC	1VDC
2	1N5GT	0V.	3.3VDC	82VDC	100VDC	0V.	0V.	1.7VDC	0V.	0V.
3	1N5GT	0V.	1.7VDC	100VDC	100VDC	0V.	0V.	0V.	0V.	0V.
4	1H5GT	0V.	6VDC	82VDC	0V.	4VDC	1VDC	4.6VDC	4.6VDC	1VDC
5	3Q5GT	0V.	6VDC	95VDC	100VDC	0V.	0V.	8.9VDC	7.6VDC	-
6	117Z6GT	0V.	117VAC	117VAC	135VDC	117VAC	0V.	0V.	135VDC	-

$TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	1A7GT	INF	*	5KΩ	54KΩ	210KΩ	5KΩ	*	2.3 Meg.	2.3 Meg.
2	1N5GT	INF	*	16KΩ	5KΩ	INF	0Ω	*	1.7 Meg.	1.7 Meg.
3	1N5GT	INF	*	5KΩ	5KΩ	INF	10KΩ	*	INF	10KΩ
4	1H5GT	INF	*	420KΩ	INF	540KΩ	4 Meg.	*	*	4 Meg.
5	3Q5GT	0Ω	*	6KΩ	5KΩ	1.5 Meg.	0Ω	*	*	-
6	117Z6GT	0Ω	230Ω	230Ω	2.5KΩ	230Ω	0Ω	0Ω	2.5KΩ	-

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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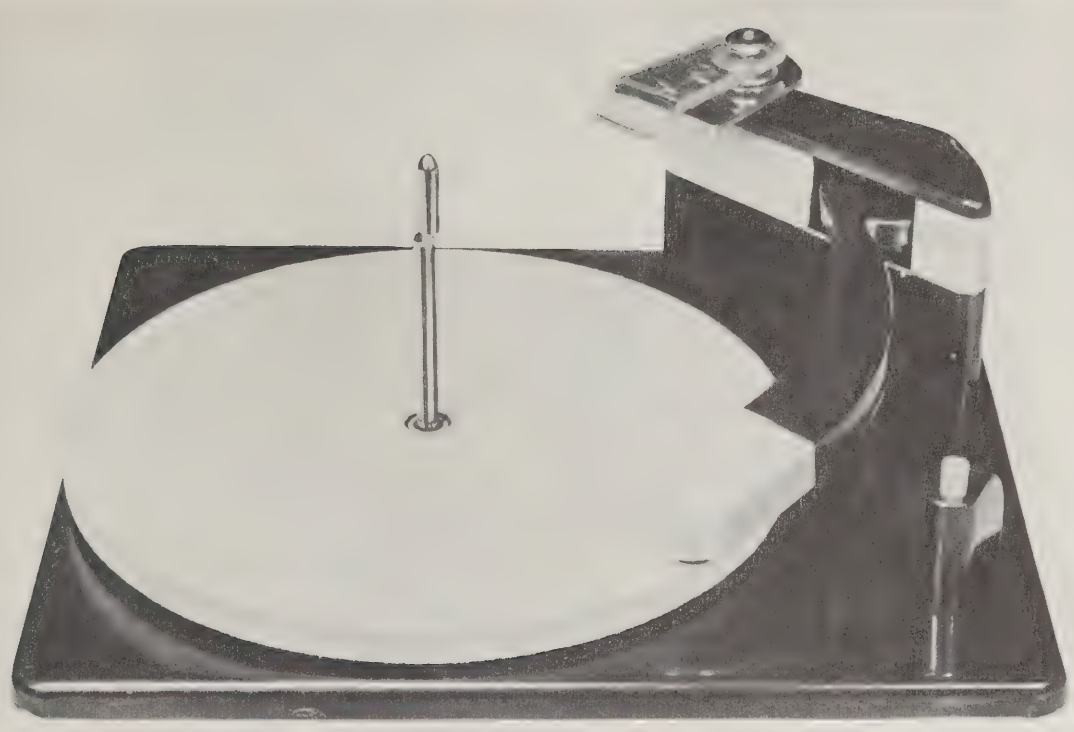
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting volume control.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.



TOP VIEW

GENERAL INFORMATION

The Model 204 is an automatic cam-type changer, featuring single-button control, automatic shut-off, and eccentric spindle record selection. It will play and automatically change twelve 10-inch or ten 12-inch records (not intermixed) at a single loading.

Manufacturer: GENERAL INSTRUMENT AND APPLIANCE CORP., 829 Newark Ave., Elizabeth, New Jersey

Parts should be ordered from the manufacturer of the receiver using this changer.

THIS CHANGER HAS BEEN USED IN POSTWAR MODELS, UP TO THE PRESENT TIME, BY THE FOLLOWING MANUFACTURERS:

Belmont Radio Corp.	5921 West Dickens Avenue, Chicago, Illinois
Crosley Corporation	1329 Arlington Street, Cincinnati, Ohio
Emerson Radio & Phono Corp.	111 8th Avenue, New York, New York
Fada Radio & Elec. Co., Inc.	30-20 Thomson Avenue, Long Island City, New York
General Electric Company	1285 Boston Avenue, Bridgeport, Connecticut
Gilfillan Bros.	1815 Venice Boulevard, Los Angeles, California
The Hallicrafters Co.	5th & Kostner, Chicago, Illinois
Northern Electric Co.	Montreal, Que., Canada
Sears, Roebuck & Co.	925 S. Homan Avenue, Chicago, Illinois
Stewart-Warner Corp.	1826 Diversey Parkway, Chicago, Illinois
Westinghouse Electric Corp.	Sunbury, Pennsylvania

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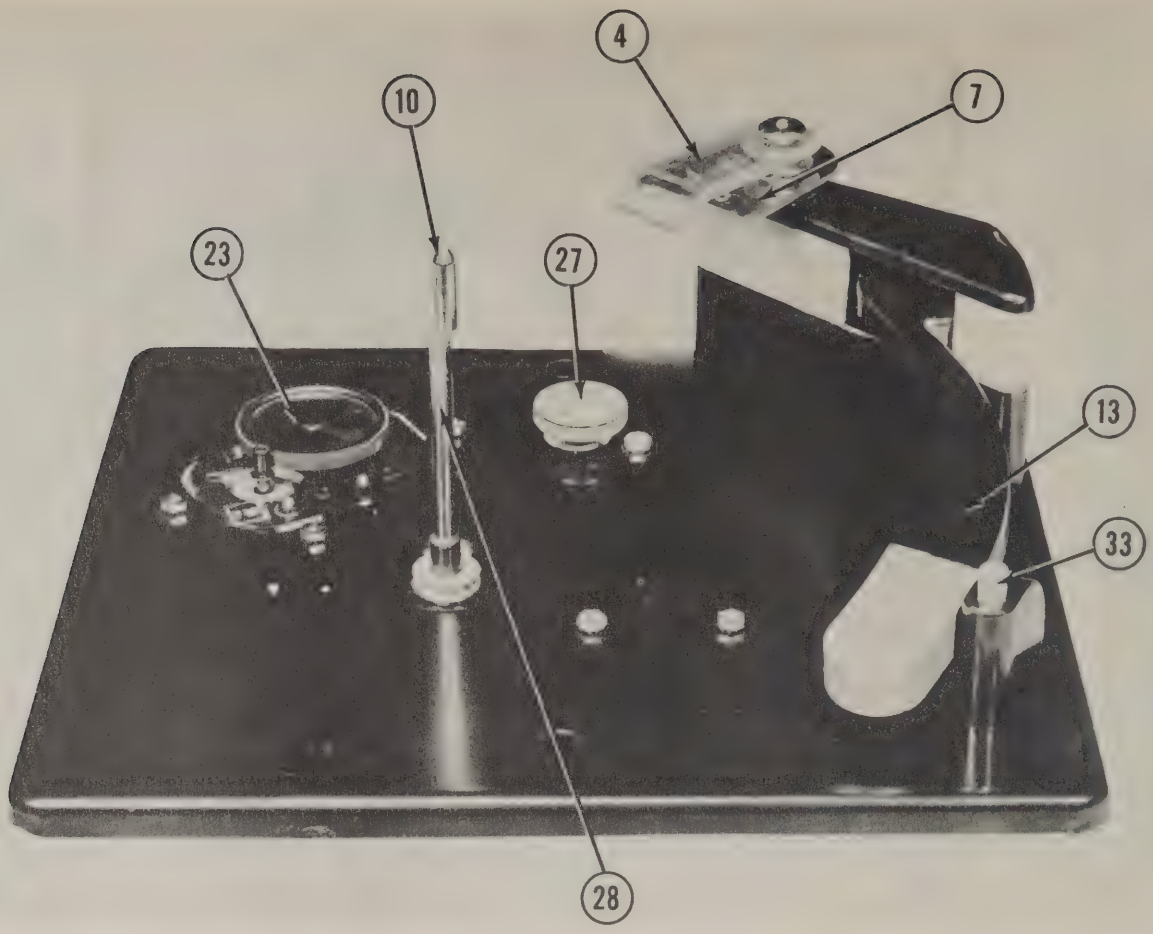
GENERAL INSTRUMENT
MODEL 204

GENERAL INSTRUMENT
MODEL 204



TOP VIEW LESS TURNTABLE

AUTOMATIC OPERATION

1. Turn the spindle cap (10) until a step appears (one-half turn off center).

2. Turn the record stabilizer finger (4) out of the way.

3. For 10-inch record, turn the record support (7) to 10-inch position. For 12-inch operation turn the record support to the 12-inch position, so the wide edge faces the spindle.

4. Place the records on the spindle so that they rest on the record support and the step on the spindle. Swing the stabilizer finger (4) so that it rests on the top record.

5. Start operation by pressing down on the pickup arm (13), thus pressing the control button (33) to start the change cycle.

6. After the last record is played, the pickup arm will return to a rest position on the control button and the motor will automatically stop.

7. To discontinue operation before the automatic shut-off goes into effect, remove all unplayed records from the record support (4) and press the control button.

8. To reject a record, press the control button (33).

9. To remove the records from the turntable:

   (a) Align the spindle cap (10) with the spindle.

   (b) Turn record finger (4) clear of the records.

   (c) Lift records, tilting slightly to clear record support (7).

MANUAL OPERATION

1. Align the spindle cap (10) with the spindle (28).

2. Turn record support (7) to 12-inch position.

3. Place record on the turntable (19).

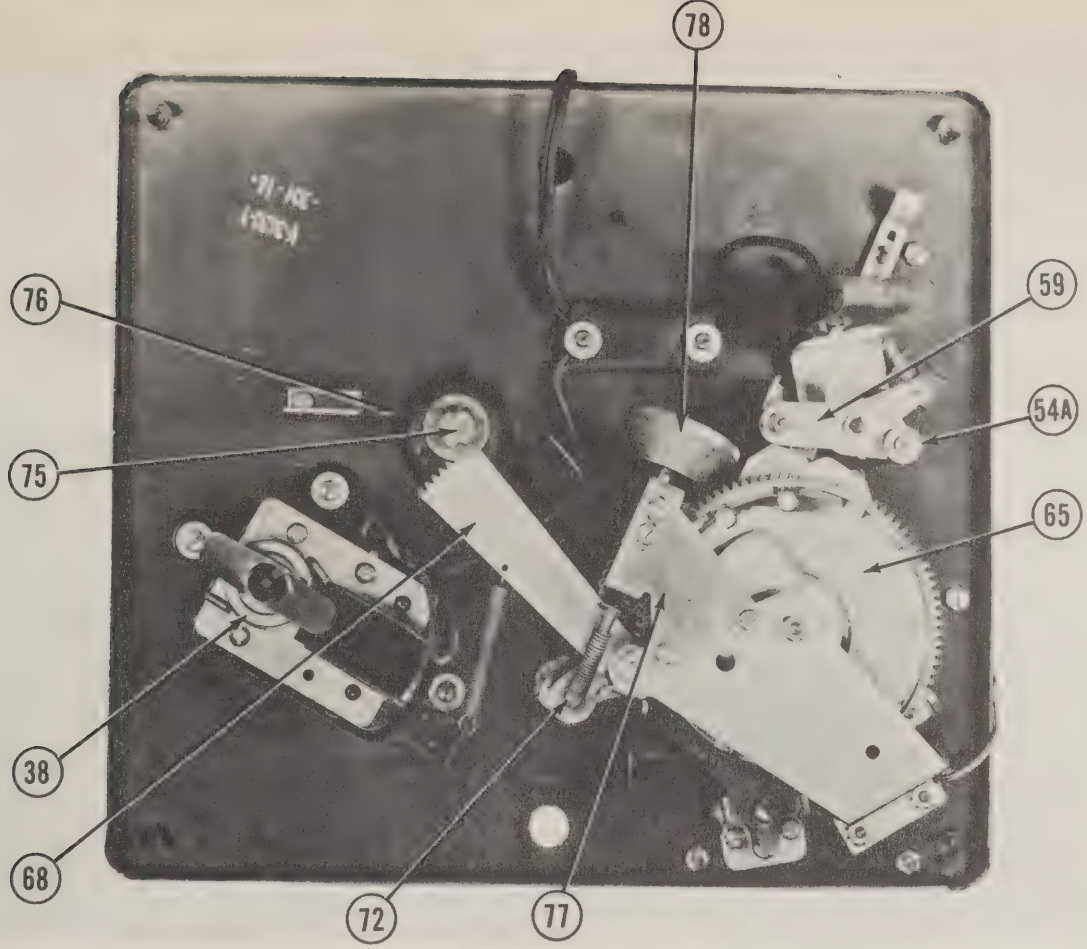
4. Place the pickup arm (13) on outer edge of the record. This will automatically start the motor.

5. After the record has been played (Standard record), the pickup arm will return to a rest position on the control pin (33), and the motor will stop.

6. In case of home recordings, or records without the eccentric groove in center of the record, the control pin (33) may have to be pushed to return the pickup arm to a rest opsition.

CHANGE CYCLE

To start operation of the changer, press down on the pickup arm which will be at rest position on the control button (33). By pressing the control button, the trip bar (53) is actuated, causing the mercury switch trip lever (52) to pivot against the roller (56) of the switch lever assembly (59). The roller is then forced down, disengaging the roller from the stop lever (64). The switch lever assembly (59) then turns the mercury switch (59A) to "on" position, thus starting the motor. The trip bar (53) also pushes against the trip lever assembly (48A) disengaging the trip lever and the trip cam (65A). This causes the carrier lever (48) to swing outward, moving the drive wheel (27) against the turntable rim. The rotation of the drive wheel (27) is transmitted to the



BOTTOM VIEW

worm gear (73) by means of the flexible drive shaft (72). The worm gear drives the main cam, which controls all the motion of the change cycle.

As the cam (65) turns, the boss on the cam moves away from the stop lever (64). The stop lever is then pulled against the selector lever assembly (44). Adjustment of the record support (7) to the 10-inch or 12-inch position moves the stop selector rod (18) up or down. This, in turn, determines the position of the stop selector lever (44) which sets the limit of travel of the stop lever (64). The stop lever regulates the distance of the sweep lever (58) and its attached pickup arm travel before the pickup arm is lowered to the edge of the record.

The lift pin (20A) rides up the inclined portion of the cam. This pushes the pickup arm up away from the record. The pinion (63), which is part of the sweep lever (58), swings out through the action of the cam. The pickup arm (13), which is attached to the sweep lever (58) by means of a clamp that fits around the pickup support sleeve (20), swings outward clearing the record.

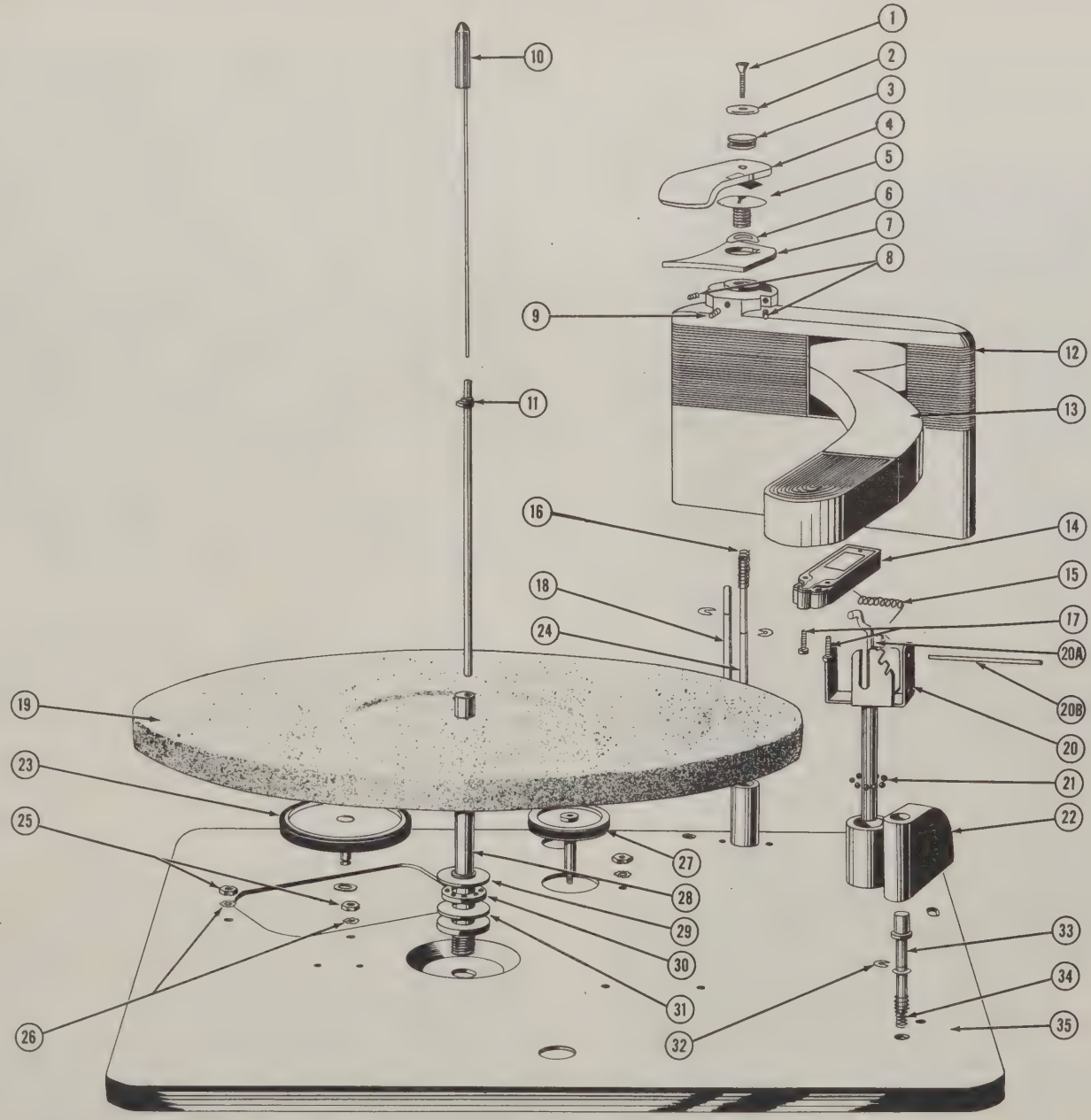
The lower side of the main cam (65) controls the record selection. Motion of the feed cam roller (67), riding around the cam, results in a backward and forward movement of the feed sector lever (68). This turns the pinion (71), causing the eccentric to rotate a definite amount for record selection and then return to its normal position, allowing the record to drop over the spindle (28).

The pinion (63) now swings inward and comes in contact with the stop lever (64), thus positioning the pickup for set-down. The lift pin (20A) rides down the inclined portion of the cam lever lowering the pickup arm to the record. The boss on the upper side of the cam engages the stop lever (64) permitting the pickup arm to proceed across the record. At the same time the boss engages the stop lever, the automatic trip cam (65A) engages the block on the trip lever (48A) and pulls the carrier lever (48) back to its original position so that the drive wheel (27) is moved away from the turntable rim. This completes the change cycle.

As the pickup arm (13) approaches the spindle, the sweep lever (58) hits the trip screw (47) mounted on the trip lever (48A). This action re-engages the drive wheel (27) with the turntable rim and starts a new cycle.

The pawl trip action is effective only after the pickup arm reaches a distance of not more than four inches from the spindle. Any reverse movement of the tone arm within this limit will cause the sweep lever (58) to push forward the pawl (51A) mounted on the auxiliary trip lever (51). This movement also has the effect of re-engaging the drive wheel.

The last record dropping to the turntable causes the release of the record finger (4), which lowers the shut-off rod (24) and forces the stop selector lever (44) clear of the stop lever (64). The stop lever then prevents any inward movement of the sweep lever (58). Therefore, the sweep lever cannot perform its usual function of actuating the switch lever. On completion of the cycle, the stop lever (64) comes in contact with the boss on the cam, causing it to hit the switch lever roller (56) and force the mercury switch (59A) to the off-position.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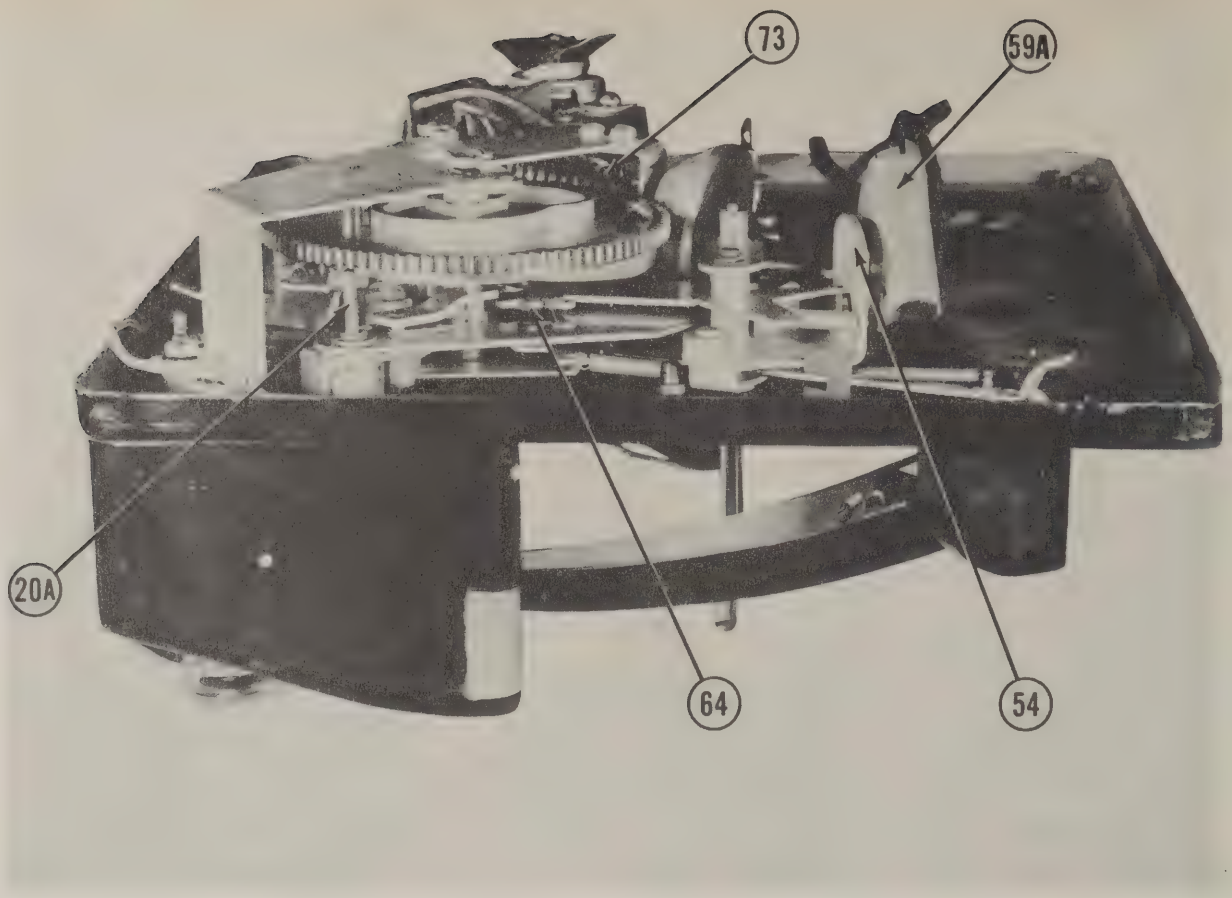


REAR VIEW

ADJUSTMENTS

Alignment of Spindle Cap

Loosen the two set screws holding the index cam (75) and turn the cap until it aligns with the spindle, with the indexing spring (76) in the detent. Retighten the set screws.

Alignment of Eccentric

The eccentric may be adjusted by loosening the screw in the feed pinion (71) and adjusting the eccentric so that it is aligned with the spindle. The normal position of the feed pinion and the sector lever (68), when not in cycle, is such that only one tooth is engaged. The position of the eccentric is correct if it is aligned with spindle when the changer is not in cycle.

Positive Trip

The trip point is adjusted by screw (47). Turning screw clockwise will delay tripping, while counterclockwise will cause the changer to trip earlier.

Record Support Position

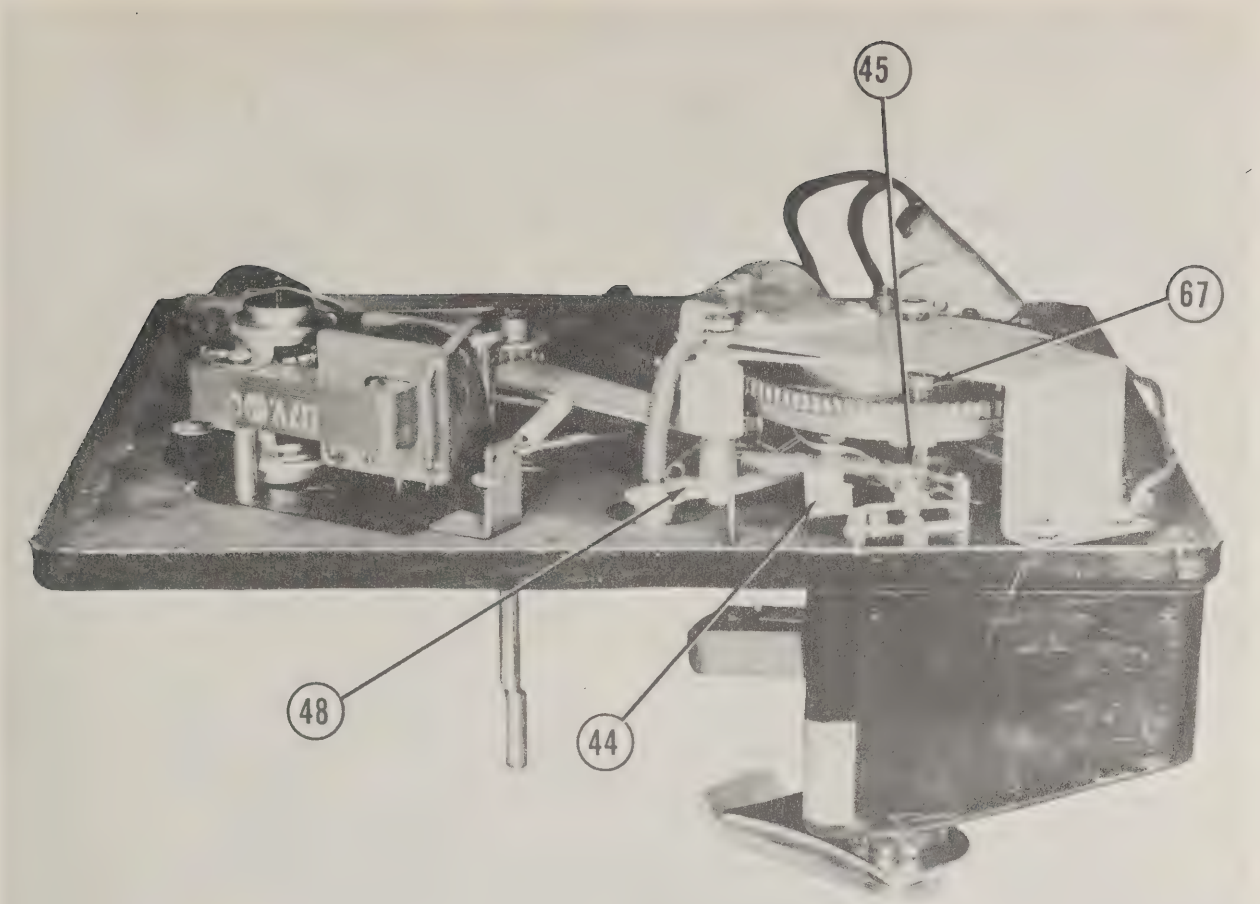
The two ends of the arc on the edge of the record support should be equi-distant from the circumference of the record when the record support is turned to each limit of its travel. This adjustment is made by the two screws (8) of the housing (12).

Pickup Arm Set-Down Point

Loosen the screw on sweep lever clamp (58) and move the pickup slightly with respect to the sweep lever. The needle should land approximately 1/8" in from the edge of the record.

Automatic Shut-Off Adjustment

Adjust the screw (45) so that it just makes contact with the shut-off rod (24) when the record finger (4) is down against the record support and the end of the stop selector lever (44) is touching the base plate (35).



SIDE VIEW

TROUBLES

1. Changer fails to shut off automatically:
   (a) Check the paragraph on "Automatic Shut-Off Adjustment."
   (b) Check the switch roller and shaft (56) to see if it is binding.
2. Changer trips before completion of record:
   (a) Turn trip screw (47) clockwise.
3. Changer fails to trip after completion of record:
   (a) Turn trip screw (47) counterclockwise.
4. Turntable speed slow:
   (a) Be sure drive wheel does not strike turntable. Adjust by turning eccentric bushing. Adjustment should be very slight.
   (b) Clean any grease or oil from rim of turntable and idler wheel with carbon tetrachloride.
5. Stalling in cycle:
   (a) Clean drive wheel and turntable rim.
   (b) Check mesh of worm gear and main cam.
   (c) Check for binding in spindle assembly.
6. Records fail to drop:
   (a) Check meshing of feed sector (68) with record feed pinion (71) (see "Alignment of Eccentric").
7. First record does not play:
   (a) Bend lift pin (20A) slightly so pickup arm will rest on the record. Do not bend too much as this will prevent the playing of top record.

LUBRICATION

Avoid excessive lubrication. Do not, under any circumstances, permit oil or grease to get on the rubber idler drive wheels, the motor pulley, or the turntable rim. Any oil or grease at these points should be removed with carbon tetrachloride.

1. Apply No. 10 oil to the pickup arm shaft.
2. Lubriplate with a small brush:
   (a) Main cam actuating surface.
   (b) All movable flat surfaces.
3. Apply *STA-PUT* with a small brush to:
   (a) Teeth of main cam gear.
   (b) Worm gear.
   (c) Teeth feed sector lever.

PARTS LIST

Ref. No.	Part No.	DESCRIPTION
1	33-71613	Finger spring screw
2	39-71968	Finger button
3		Grommet
4	55-71604	Record stabilizer
5		Record support and sleeve mounting nut
6		Spring washer
7	62-71314	Record support
8		Record support adjusting screws
9		Set screws
10	21A71637	Spindle cap assembly
11	43A71646	Eccentric assembly
12	21A71867	Housing, sub-assembly
13	69A71970 69A71971	Pickup arm (minus cartridge) without needle-screw hole Pickup arm (minus cartridge) with needle-screw hole
14		Pickup cartridge
15	33-71611	Counterbalance spring
16	33-71613	Spring, shut-off rod
17		Pickup cartridge mounting screw No. 4-40 x 1/4"
18	12A71623	Stop selector rod assembly
19	66A72197	Turntable (specify model and color)
20	10A71616	Pickup arm hinge assembly
20A	12-73428	Lift pin
20B	12-71596	Arm hinge pin
21	36-80656	Steel balls (nine)
22	21-71730	Housing, manual control
23	28A72869 28A72833	Idler wheel (use with internal fan type) Idler wheel (use with external fan type)
24	12-72708	Automatic shut-off rod
25		Hex Nut 6-32
26		Lock washer
27	19A71206	Drive wheel assembly
28	19A72783	Spindle and bearing assembly
29	32-72485	Washer 13/16" O.D.-3/8" I.D. turntable bearing
30	30A72491	Thrust bearing assembly
31	32-72485	Washer 13/16" O.D.-3/8" I.D. turntable bearing
32	32-50745	"C" washer
33	12A71622	Manual control pin assembly
34	33-71317	Control button spring
35		Base plate
36		Lock washer for mounting spindle base
37		Mounting nut 3/8" x 32
38	56-72096 56-72098	Motor (external fan type) Motor (internal fan type)
39		Spacer, motor mounting
40		Flat washer
41		Screw 6-32 x 5/8"
42		Screw 6-40 x 1/4"
43	33-71768	Stop selector lever spring
44	55A71328	Stop selector lever assembly
45		Screw 10-32 x 3/8"
45A		Lock nut No. 10-32
46	33-71342	Spring carrier lever
47	1480-A	Trip point adjustment screw
48	55A73277	Carrier lever assembly
48A	55A71394	Trip lever assembly
49	33-71173	Trip lever spring
50	12-70510	Feed sector mounting stud
51	55A72653	Auxiliary trip lever assembly
52		Mercury switch trip lever
53	41A71263	Trip bar
54	58A72555	Switch bracket assembly
55	33-71318	Trip bar spring
56		Roller, switch lever
57	33-71256	Spring, roller and switch lever assembly
58	55A71295	Sweep lever assembly
59	55A72543	Switch lever assembly
60	33-72690	Mercury switch spring
61		Sweep lever crank screw
62	33-71316	Stop lever spring
63		Sweep lever pinion
64	55A71298	Stop lever assembly
65	43A71301	Cam assembly
66	10-71370	Mounting bracket
67	65-70566	Feed cam roller
68	27A71293	Feed sector assembly
69	33-71341	Record feed spring
70		Spacer washer
71	28A71289	Pinion assembly
72	33A71196	Drive spring assembly
73	29A73790	Worm assembly
74	32-72946	Flat washer 7/8" O.D. x 1/8" I.D.
75	65A71291	Indexing collar assembly
76	59A71305	Indexing spring assembly
77	10-70512	Worm adjusting bracket
78	29A73790	Vibration dampener (with drive assembly)

TOP VIEW

GENERAL INFORMATION

This changer is designed to play up to twelve 10-inch or ten 12-inch records, not intermixed. Adjustment for record size is made by a lever on the top of the ejector mechanism housing. The last record is repeated until the changer is turned off. Manual operation is provided. The change cycle is initiated by a solenoid trip.

To remove this changer from its chassis pan, first reach through the hand holes in the pan and remove the spring clips from the mounting bolts.

LOADING

Set the record size selector lever for the size records to be played, and raise the pressure arm (1). Press the top section of the record spindle (6) down slightly and turn counterclockwise to the loading, or offset, position. Place the stack of records on the spindle so that the stack is supported by the record support plate (15), which protrudes from the ejector housing (2), and the shoulder of the record spindle. Lower the pressure arm until it rests on the record stack.

Set the three-position slide switch (3) to the "Auto" position and press the "Record Change" button on the radio control panel. The changer will then play the entire stack of records, repeating the last record until turned off. To unload, it is only necessary to turn the top section of the record spindle clockwise so that the stack of records may be lifted from the spindle.

Manufactured by: ZENITH RADIO CORPORATION • CHICAGO, ILLINOIS

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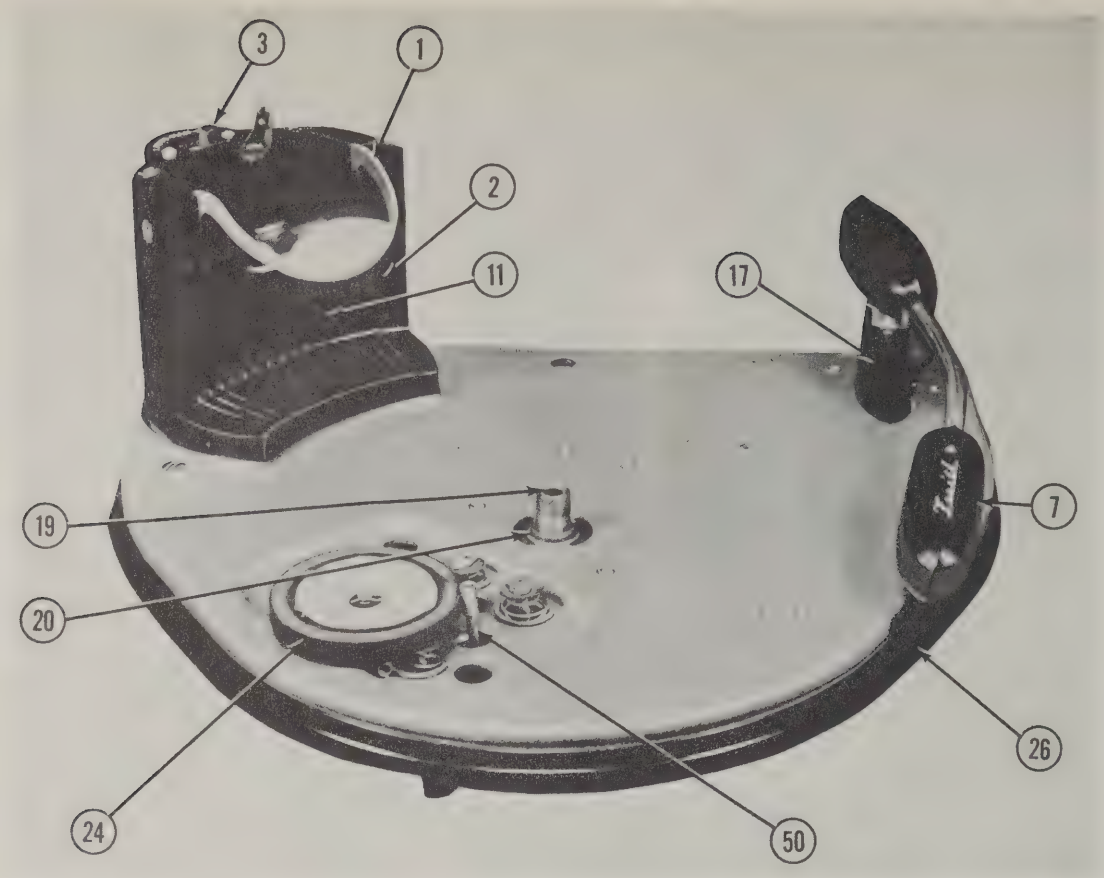
ZENITH
MODEL S-11468

ZENITH
MODEL S-11468



TOP VIEW MINUS TURNTABLE

THE CHANGE CYCLE

As the pickup arm moves toward the center of the record, the pawl trip lever (52) moves toward the cycling switch trip lever (39). At the completion of the playing of the record, the needle enters the eccentric groove and the pawl engages the trip lever, closing the cycling switch (70) and energizing the solenoid (66). If the record does not have an eccentric groove, the position trip lever (53) closes the cycling switch.

Energizing the solenoid starts the change cycle. This is accomplished either as described above or by pushing the "Record Change" button located on the radio control panel. As the armature of the solenoid moves, it pulls the clutch trigger (48), releasing the spring loaded trip lever plate (38). This actuates the clutch release lever (60), engaging the clutch (49). As the clutch release lever is tripped, it also opens the solenoid cutout switch (71), opening the solenoid coil circuit to prevent chatter. When the clutch is engaged, the drive chain (68) is driven by the drive sprocket (44) and, in turn, drives the timing sprocket (36) and the selector sprocket (61).

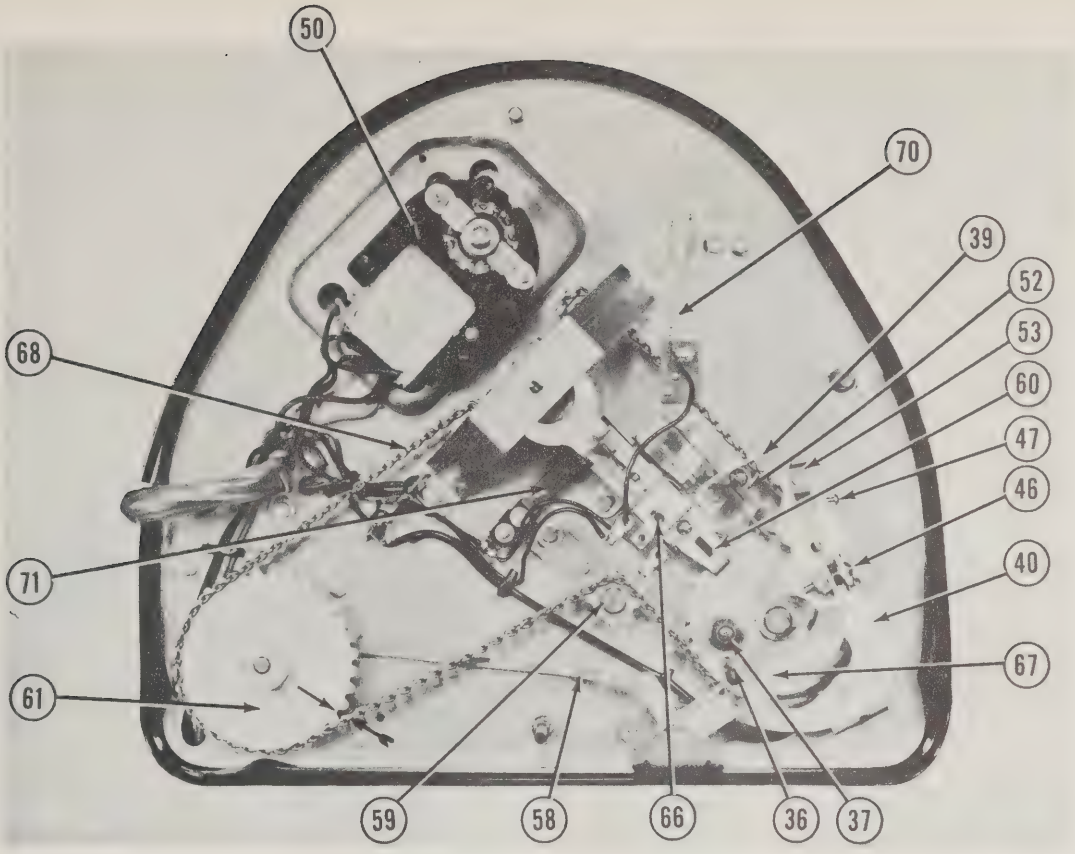
The timing sprocket raises the pickup arm lift pin (9) to raise the pickup arm from the record. The locating bushing pin (37) on the timing sprocket swings the pickup arm clear of the record by means of the pickup arm control lever (40). For 10-inch records, the record size lever (67), which has been brought into position by the selector cam link (58), raises the locating bushing as the timing sprocket revolves. For 12-inch records, the record size lever is moved aside so that the bushing is not raised; therefore, the locating bushing pin engages the pickup arm control lever. The difference in diameter of the bushing and its pin furnishes the one inch difference in the set down position of the pickup arm for 10 and 12-inch records.

The selector sprocket, which also moves at this time, drives the record ejector cam (5), actuating the record ejector plate (13), causing the bottom record of the unplayed stack to drop to the playing position on the turntable.

Half way through the cycle, the clutch trigger assembly is reset by means of a cam on the surface of the timing sprocket. This also closes the solenoid cutoff switch.

The locating bushing (or its pin, in the case of 12 inch records) brings the pickup arm into its set down position. The pickup arm lift pin is then lowered allowing the pickup arm to land on the record. At this point the clutch release lever is returned to its original position with its tip in a rectangular hole in the timing sprocket.

This releases the clutch and the change cycle is complete.



BOTTOM VIEW

ADJUSTMENTS

To Remove Turntable

The turntable is held by its taper fit on the drive shaft bearing assembly. To remove, hold clutch (49) with one hand and turn turntable with the other. When replacing turntable, be certain that the idler wheel (24) is inside the rim before the turntable is seated.

Set-Down Point

The pickup arm set-down point may be adjusted by means of the set-down adjustment screw (46). Turning this screw clockwise moves the point closer to the record spindle. On early models, this spring-loaded adjustment screw was not incorporated; instead, the pickup arm control lever was held in adjustment by a locking screw. When loosened, this allowed the position of the pickup arm control lever to be changed in relation to the pickup arm.

Pickup Arm Height Adjustment

An adjustable lift pin (9) is provided to permit proper pickup arm lift. At its maximum rise, the pickup arm should clear the bottom of the unplayed stack by approximately the thickness of a standard record. If the lift is greater, the pickup may strike the upper record, or if the lift is not great enough, the needle will not clear the last record of a full stack.

The lift pin is adjusted by loosening its locknut and screwing the small threaded tip in to shorten the lift, or out to increase the lift.

Cycling Switch Adjustment

The cycling switch (70) is in correct adjustment when its contacts are spaced approximately .02 inch apart, with the pickup arm in its outward position, so that the pawl trip lever (52) does not touch the cycling switch lever (39).

This spacing may be adjusted by loosening the screws which fasten the assembly to the main base plate.

Position Trip Adjustment

A position trip is provided to insure starting of the change cycle in instances where the record does not have an eccentric groove. Adjustment of the position trip adjustment screw (47) changes this trip point. Turning the screw clockwise will cause the mechanism to trip earlier. Backing the screw out will delay the tripping.

Normal adjustment is obtained with the tripping occurring when the needle is 1¾" from the center of the spindle.

Sprocket Drive Chain Adjustment

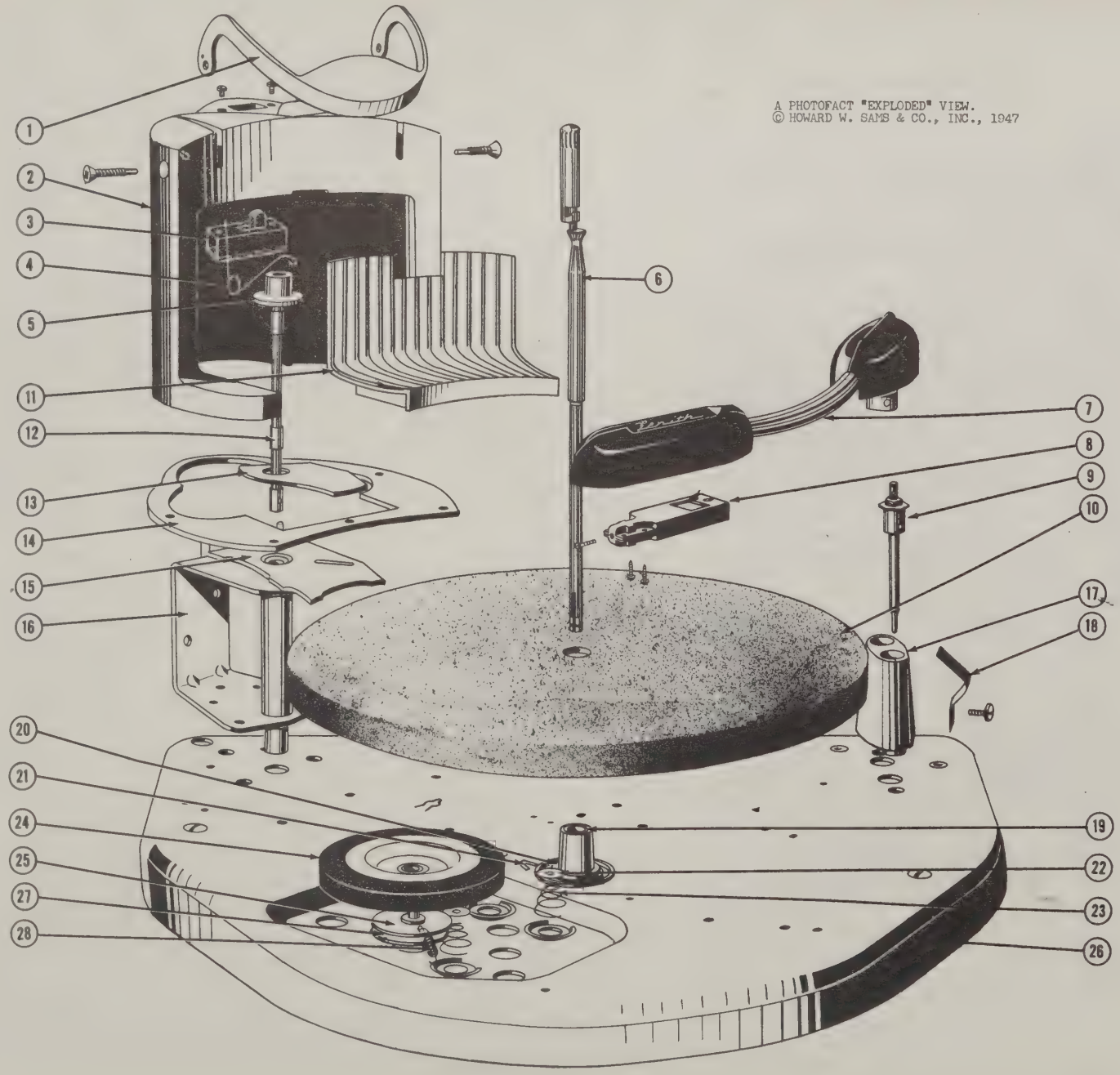
The tension of the drive chain may be adjusted by means of the adjustable idler sprocket (59).

Chain Removal and Synchronization

In the event that it is necessary to remove the chain, the timing sprocket and the selector sprocket must be synchronized when the chain is replaced.

The selector sprocket (61) is stamped with an arrow which is to be lined up with a similar arrow on the base plate when the tip of the clutch release lever (60) is in its untripped position in the rectangular hole in the timing sprocket (36).

The chain is removed by opening a link and should be replaced with the open side out.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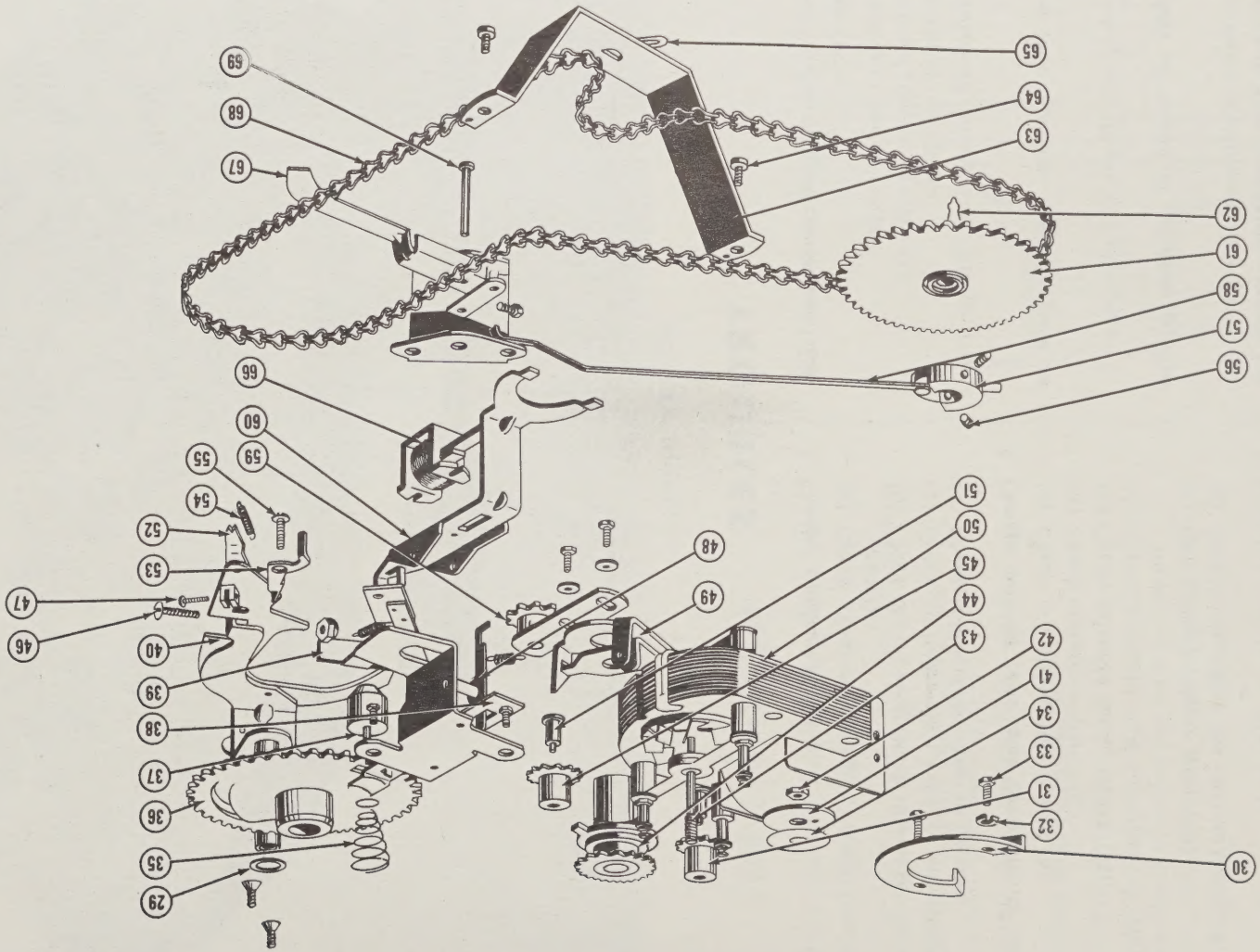
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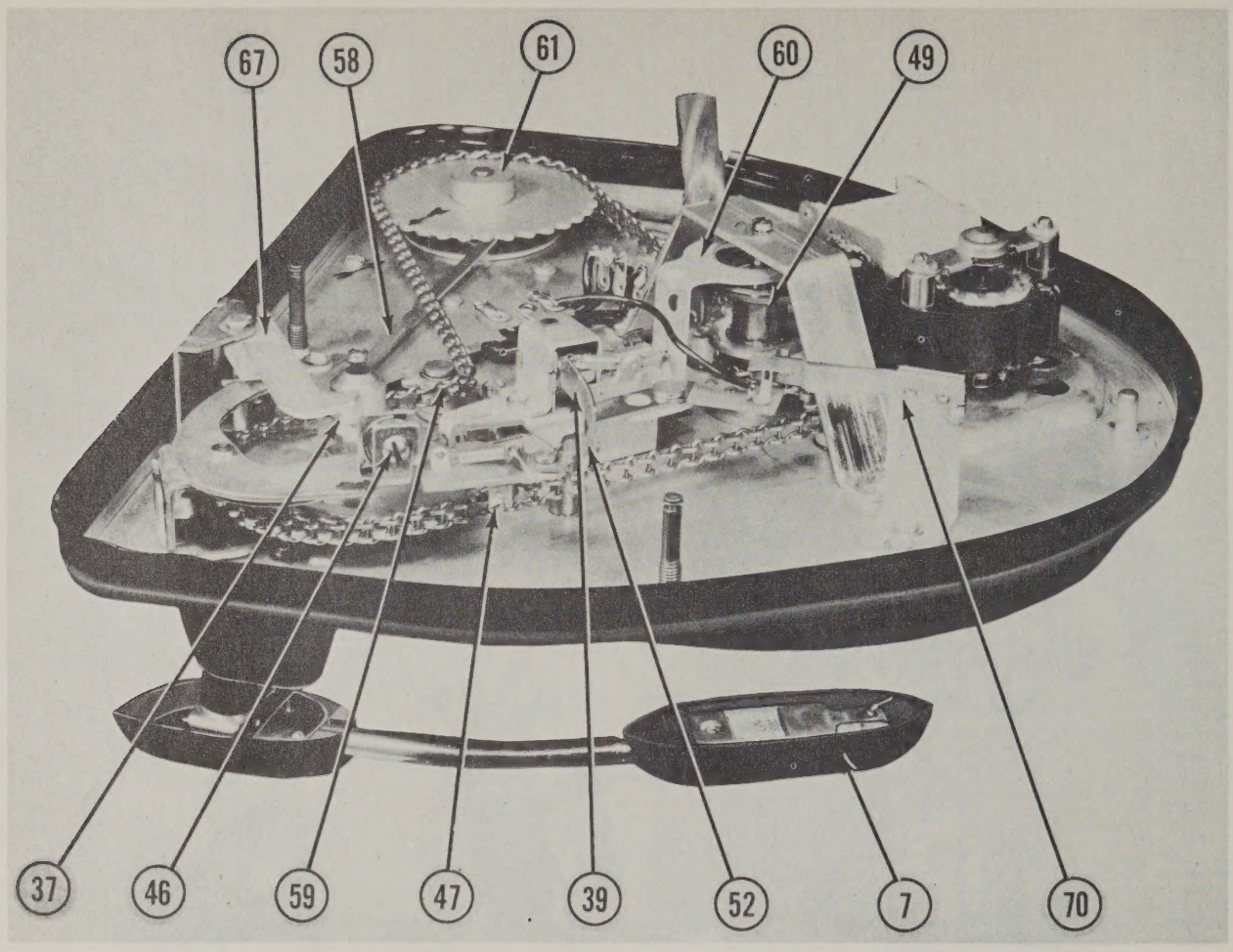


SIDE VIEW (RIGHT)

TROUBLES

1. ***"Record Change" button on radio control panel does not start change cycle:***
   - (a) Check "Record Change" switch.
   - (b) Check solenoid cutout switch (71).
   - (c) Check solenoid coil circuit.
   - (d) Check solenoid energizing voltage from motor.

2. ***Needle fails to clear maximum load of records on turntable:***
   - (a) Check pickup arm lift pin (9) adjustment.

3. ***Pickup arm falls off record or set-down position varies:***
   - (a) Check set-down adjustment screw (46).
   - (b) Check pickup arm mounting screws for looseness.
   - (c) Check plastic pickup arm housing for cracks or breaks.
   - (d) Check changer to see that it is level.

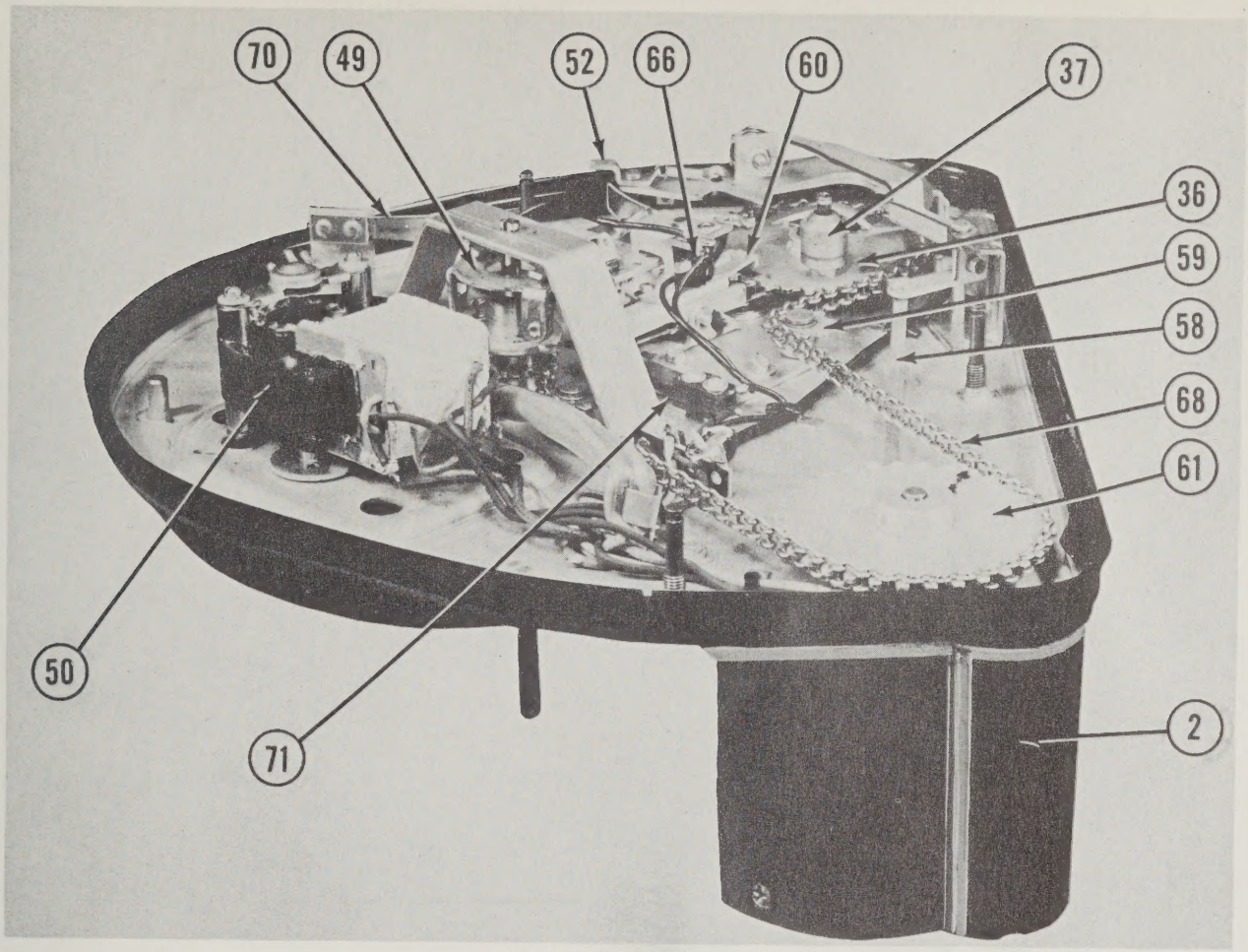
4. ***Changer cycles with switch set at manual position:***
   - (a) Check 3-position slide switch (3).

5. ***Changer continues to cycle:***
   - (a) Check "Record Change" switch (on radio panel).
   - (b) Check for sticking clutch release mechanism.
   - (c) Check cycling switch (70) for adjustment.
   - (d) Check solenoid for short to ground.

6. ***Changer will not cycle upon completion of record:***
   - (a) Check 3-position slide switch (3).
   - (b) Check cycling switch (71).
   - (c) Check solenoid cutout switch (70).
   - (d) Check solenoid coil for open or shorted turns.
   - (e) Check clutch release lever (60).
   - (f) Check drive chain for extreme tightness.

7. ***Squeaks when changer is in cycle:***
   - (a) Check lubrication of timing sprocket (36) surfaces.

8. ***Squeaks during playing of record:***
   - (a) Check friction between record and spindle. A thin coating of wax on spindle will remedy.



SIDE VIEW (LEFT)

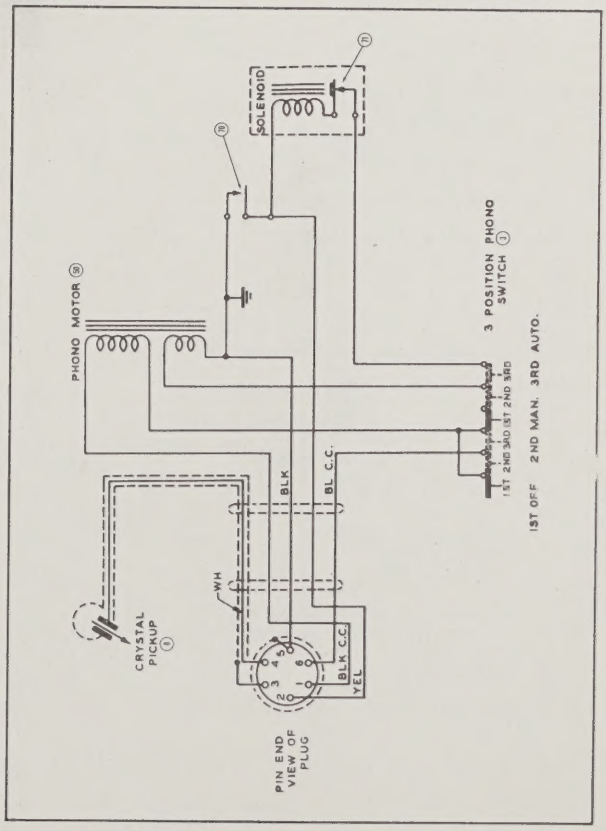
LUBRICATION

Use light machine oil on the following points:

1. Idler wheel (24) bearing.
2. Upper and lower motor (50) bearings (saturate oil wicks).
3. Record spindle guide bearing (19).
4. Lower drive shaft bearing (44).
5. Drive shaft thrust bearing (20).

Use Lubriplate on the following points:

1. Teeth of all sprockets.
2. Lower part of clutch (49).
3. Both surfaces of timing sprocket (36).
4. Upper surface of record size lever (67).



PARTS LIST

Ref. No.	Part No.	DESCRIPTION
1	S-11444	Record pressure arm assembly
2	43-92	Record ejector housing (black polystyrene)
3	85-371	3-position slide switch
4	40-448	Pressure arm spring
5	128-20	Record ejector cam
6	S-11103	Record spindle assembly
7	S-11102	Pickup arm assembly
8	142-62	Crystal pickup
9	S-11100	Pickup arm lift pin assembly
10	S-11443	Turntable
11	24-334	Record ejector housing cover (black polystyrene)
12	76-409	Record ejector cam shaft
13	S-11105	Record ejector plate and pin assembly
14	57-1068	Record ejector housing plate
15	S-11106	Record support plate—shaft and pin assembly
16	S-11107	Record support and ejector bracket assembly
17	43-88	Pickup arm support housing
18		Pickup arm lift pin return spring
19		Record spindle guide bearing
20		Drive shaft thrust bearing
21		Motor mounting clip
22		Motor mounting washer
23		Motor mounting spring
24	S-11118	Idler wheel assembly
25	S-11657	Idler stud and washer assembly
26	S-11608	Base plate
27	93-679	Idler wheel stud felt washer
28	80-368	Idler wheel tension spring
29		Pickup arm pivot shaft washer
30		Selector cam stop plate
31		Fixed idler sprocket
32		Stop plate locknut
33		Stop plate screw
34	93-677 93-678	Idler wheel stud fishpaper washer (large) Idler wheel stud fishpaper washer (small)
35	80-472	Trip lever plate actuating spring

Ref. No.	Part No.	DESCRIPTION
36	S-10730	Timing sprocket
37		Locating pin and bushing
38		Trip lever plate
39		Cycling switch trip lever
40	S-10753	Tone arm pivot shaft and bracket assembly
41	93-673	Idler wheel stud washer—threaded
42	54-66	Idler wheel stud nut
43	80-453 80-452	Spring bushing for 60-cycle operation Spring bushing for 50-cycle operation
44		Sprocket and drive shaft bearing assembly
45		Fixed idler sprocket
46		Set-down point adjustment screw
47		Position trip adjustment screw
48	80-317	Clutch trigger
49		Clutch assembly
50	141-92	AC motor
51		Idler stud
52		Pawl trip lever
53	117-106	Position trip lever
54	S-10753	Pawl spring
55	112-578	Position trip lever pivot screw
56		Set screw
57	S-1110	Selector cam
58		Selector cam link
59		Adjustable idler sprocket assembly
60		Clutch release lever
61	S-11109	Selector sprocket and bushing assembly
62	93-617	Sprocket shaft retaining washer
63	12-1065	Record spindle support bracket
64		Bracket screw
65	188-27	Record spindle retaining washer
66		Solenoid
67		Record size lever
68	214-1	Sprocket drive chain
69		Record size lever pivot
70		Cycling switch assembly
71		Solenoid cutout switch